

APPENDIX J
TRAFFIC IMPACT ANALYSIS

CONSTRUCTION IMPACT ANALYSIS

**SAN ELIJO LAGOON
RESTORATION PROJECT**

City of Encinitas, California
January 31, 2014

LLG Ref. 3-12-2139

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CONSTRUCTION IMPACT ANALYSIS

SAN ELIJO LAGOON RESTORATION PROJECT

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1.0 INTRODUCTION

Linscott, Law and Greenspan, Engineers (LLG) has prepared the following construction impact analysis to assess the impacts to the street system due to the construction-related operations associated with the San Elijo Lagoon Restoration Project located between the Cities of Encinitas and Solana Beach. The proposed restoration operations would occur in-and-around the San Elijo Lagoon, generally east and west of Interstate 5, south of Manchester Avenue and north of Lomas Santa Fe Drive.

This construction impact analysis includes the following:

- Project Description
- Existing Conditions Assessment
- Analysis Approach & Methodology
- Significance Criteria
- Analysis of Existing Conditions
- Cumulative Projects Discussion
- Construction Trip Generation/Distribution/Assignment
- Analysis of Pre-Construction and Construction Period Scenarios
- Coast Highway 101 – Bridge Replacement Assessment
- Summary of Impacts/ Mitigation Measures

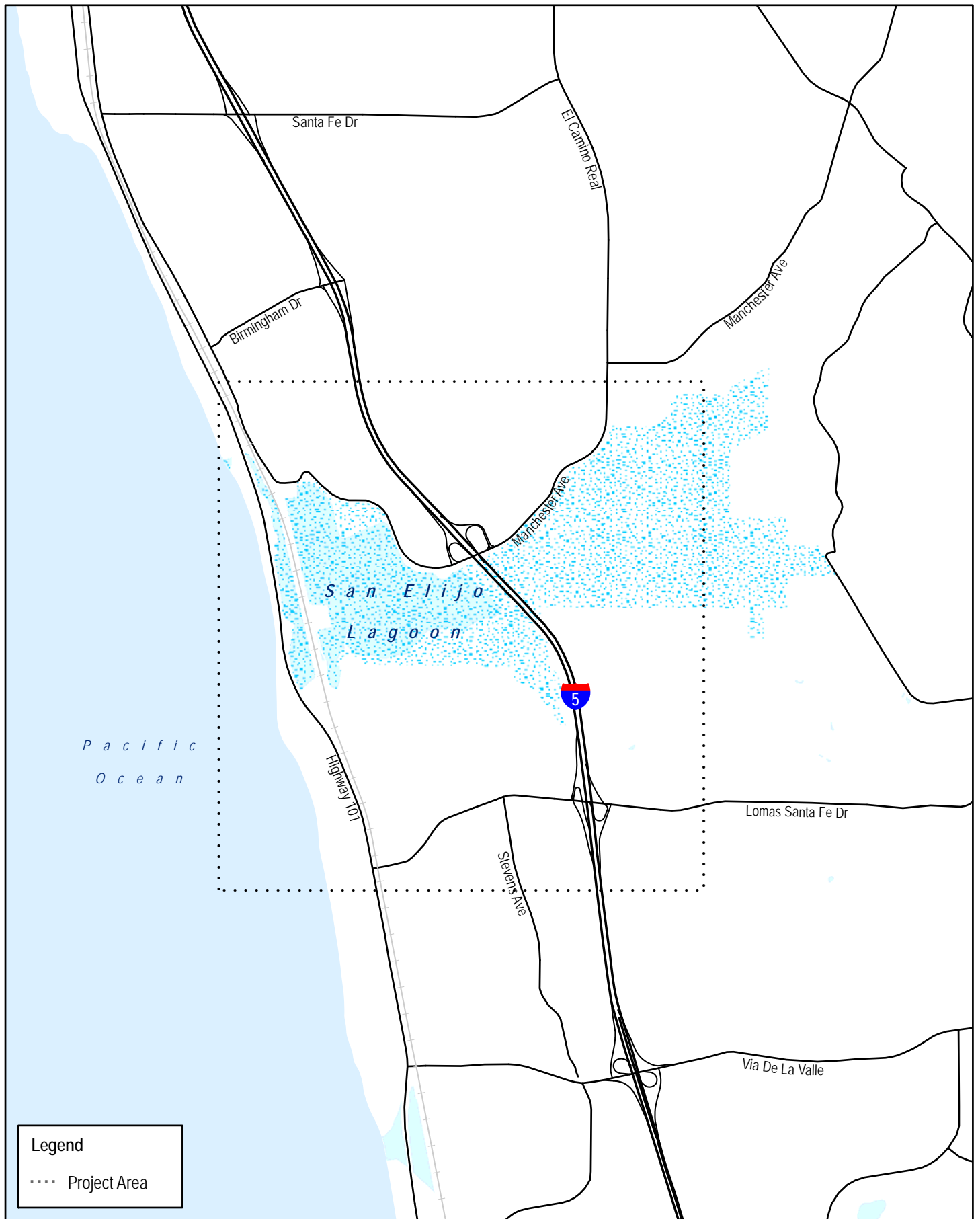


Figure 1-1

Project Area Map

SAN ELIJO LAGOON RESTORATION PROJECT

2.0 PROJECT DESCRIPTION

The following is a discussion of the study area location as well as the project description.

2.1 Project Location

The San Elijo Lagoon is located approximately 20 miles north of the City of San Diego, between the Cities of Encinitas and Solana Beach, as shown in *Figure 2-1*. The California Department of Fish and Game generally owns lands in the San Elijo Lagoon west of Interstate 5 (I-5) and the County of San Diego generally owns lands east of I-5, with the San Elijo Lagoon Conservancy owning smaller areas west of I-5.

2.2 Project Description: Alternatives and Phasing

San Elijo Lagoon represents a valuable coastal wetland with significant biological and ecological resources within the San Diego region. The lagoon functions have become compromised over time, as development and infrastructure constraints have affected the ecosystem. The San Elijo Lagoon Restoration Project (SELRP) is an effort to restore the lagoon functions and values given historic development and constraints placed on it by surrounding development activities. The project aims to enhance the tidal prism of the lagoon by proposing modifications to existing hydraulic constraints, such as channels underlying Highway 101, the North County Transit District (NCTD) railroad, and Interstate 5 (I-5). The approximate target construction start date of the SELRP is the year 2016.

The overarching goal of the SELRP is to protect, restore, then maintain, via adaptive management, the San Elijo Lagoon ecosystem and the adjacent uplands to perpetuate native flora and fauna characteristics of southern California, as well as to restore, then maintain estuarine and brackish marsh hydrology. This project goal can be further refined into four categories of objectives:

1. Physical restoration of lagoon estuarine hydrologic functions;
2. Biological restoration of habitat and species within the lagoon; and
3. Management and maintenance to ensure long-term viability of the restoration efforts.
4. Maintenance of recreational opportunities within and adjacent to the lagoon.

2.2.1 Alternatives

Four project alternatives have been identified for the SELRP, including:

- Alternative 1A: Intertidal Alternative
- Alternative 1B: Maximum Habitat Diversity Alternative, Existing Inlet
- Alternative 2A: Maximum Habitat Diversity Alternative, New Inlet
- No Project/No Federal Action Alternative

Brief descriptions of the alternatives are provided below.

Alternative 1A: Intertidal Alternative

Alternative 1A provides minimal physical changes to the site, with the exception of enlarging the main feeder channel throughout the site and redirecting its course just west of I-5. The main tidal channel would be extended farther into the East Basin and existing constricted channel connections would be cleared and enlarged. Existing habitat areas would essentially remain intact. The tidal prism of Alternative 1A would be slightly increased compared to existing conditions. A relatively small area of transitional habitat above tidal elevations would be placed in the northwest portion of the Central Basin. The channel under Coast Highway 101 would also be widened slightly, but replacement of the bridge structure would not be necessary. The existing Highway 101 bridge would be retained.

Alternative 1B: Maximum Habitat Diversity Alternative, Existing Inlet

Alternative 1B provides a more substantial change to the existing site to create a greater diversity of habitats than currently exists. The existing tidal inlet would remain the source of seawater, and the main tidal channel would extend throughout the Lagoon. A new subtidal basin off the main channel would be created in the Central Basin. The main feeder channel would be redirected just west of I-5, and extended farther into the East Basin. The channel in the East Basin would be significantly enlarged in cross-sectional area to promote more tidal exchange east of I-5. The tidal prism of Alternative 1B would be significantly increased compared to Alternative 1A. Non-tidal habitat areas would still exist in the East Basin. Several areas of transitional habitat above tidal elevations would be placed in the western portion of the Central Basin. The existing Coast Highway 101 bridge structure would be armored against ongoing scour and seismically retrofitted.

Alternative 2A: Maximum Habitat Diversity Alternative, New Inlet

Alternative 2A would improve tidal influence by constructing a new, permanently open lagoon inlet south of the existing inlet. Alternative 2A also provides changes to the existing site to create a greater diversity of habitats than presently exists. A new subtidal basin would be created just landward of the new inlet in the West and Central Basins. The main tidal channel would extend throughout the lagoon and be redirected just west of I-5, then extend into the East Basin. The channel in the East Basin would be substantially enlarged in cross-sectional area to promote more tidal exchange east of I-5. Non-tidal habitat areas would remain in the East Basin. Transitional habitat areas above tidal elevations would also be created in the western portion of the Central and East Basins. A new bridge along Coast Highway 101 would also be constructed to span the proposed new inlet location, and would incorporate a dedicated pedestrian sidewalk to ensure uninterrupted pedestrian access along the shoreline.

No Project/No Federal Action Alternative

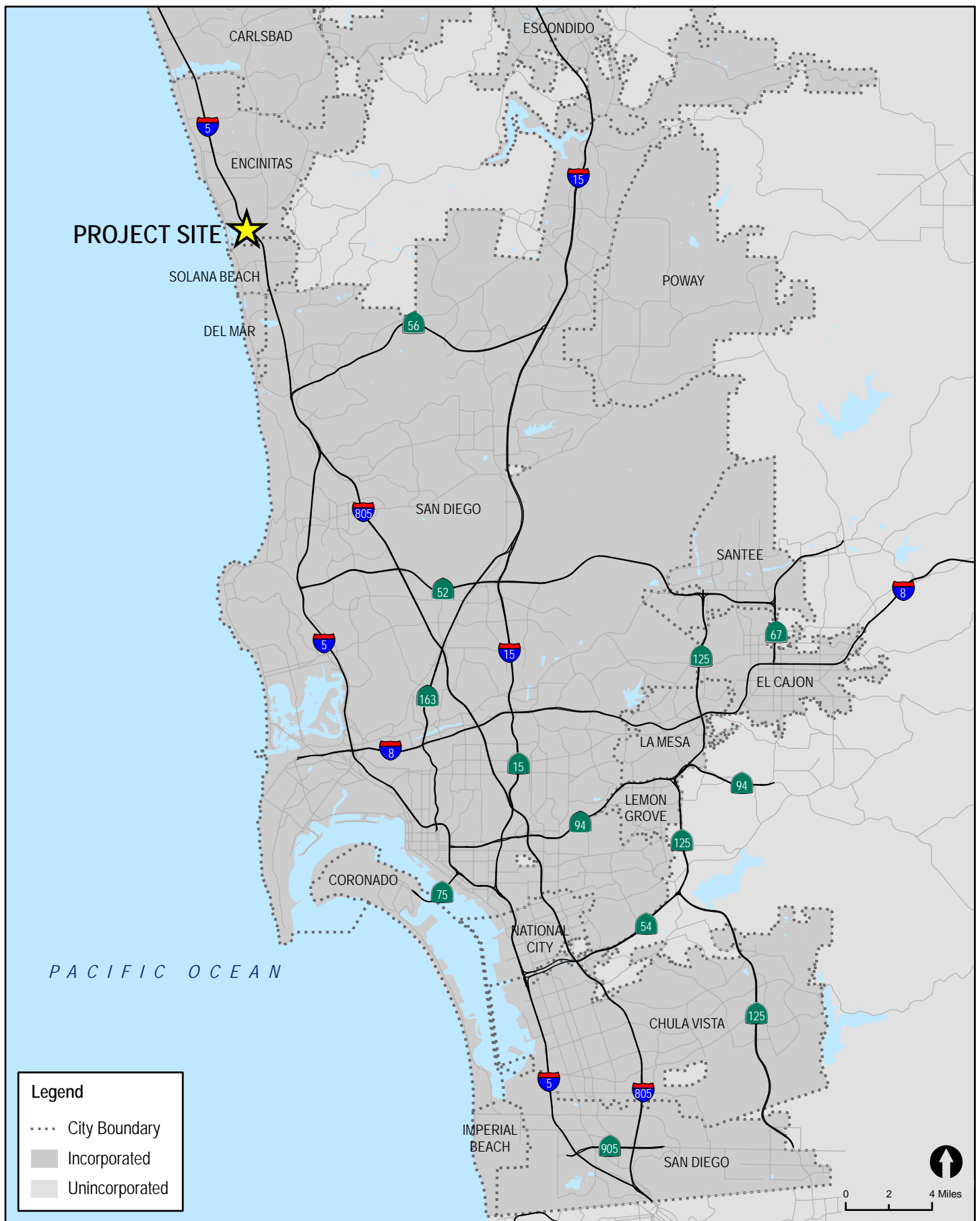
The No Project/No Federal Action Alternative is required to be examined under both NEPA and CEQA. Under this alternative, there would be no dredging or excavation to improve tidal circulation, channel clearing, or other comprehensive actions to improve tidal exchange or upstream flooding. The lagoon inlet would remain in its existing location. Currently, management of the lagoon involves mechanical excavation to maintain an open inlet condition. The present spectrum of environmental constraints would continue to limit the carrying capacity and productivity of the lagoon. The continued transition from open water lagoon to salt marsh and riparian habitat is anticipated due to continued sedimentation in the lagoon. A component of this transition includes the continued loss of mudflats as they convert to saltmarsh habitat, which shows the tremendous increase in pickleweed between 2001 and 2006. This transition is occurring fairly rapidly. Also under this alternative, tidal and fluvial flow muting is expected to continue, and continued maintenance to keep the lagoon inlet open would be necessary. Additionally, urban development around the lagoon and its watershed would continue to affect the current conditions. This alternative would not maximize the opportunity to implement a comprehensive restoration project for the entire lagoon. However, the management agencies may continue to implement a number of restoration, enhancement, and creation projects on a much smaller scale, and incrementally.

2.2.2 Phasing

The project team estimates that there would be four phases of construction. This construction impact study evaluates the potential effects of traffic for the worst-case phase of construction, between 2016 and 2019, as follows:

- Phase 1: Winter 2016 – Winter 2017
- Phase 2: Winter 2017 – Fall 2018
- Phase 3: Fall 2018 – Spring 2019
- Phase 4: Spring 2019 – Fall 2019

Although the work would generally occur in sequenced phases, it is anticipated that construction would occur year-round and these phases would be implemented without pause. Some construction activities would be restricted to daytime hours, but some activities require 24 hours a day of operation to remain efficient (e.g., dredging and materials disposal/placement activities). Additionally, some activities such as materials delivery may be scheduled for nighttime hours to minimize additional effects, such as traffic or circulation (e.g. movement of pedestrians and motorized and/or non-motorized vehicles) during summer hours. Phasing would allow the SELC to incorporate restrictions on specific construction activities to minimize effects to sensitive resources within the lagoon. For example, clearing and grubbing of habitat areas would be restricted to outside of the bird breeding season to limit effects to breeding bird populations.



3.0 EXISTING CONDITIONS

Effective evaluation of traffic impacts associated with the proposed San Elijo Lagoon Restoration Project requires an understanding of the existing transportation system within the project area. *Figure 3-1* shows an existing conditions diagram, including signalized intersections and lane configurations.

3.1 Existing Street Network

The following is a description of the existing street network in the study area.

Interstate 5 (I-5) is classified as a Freeway and built as an eight-lane divided roadway traversing the lagoon. Carpool lanes are not provided on I-5 in the vicinity. The nearest interchanges to the project area are at Lomas Santa Fe Drive, Manchester Avenue, and Birmingham Drive. On-ramps at these interchanges are all metered with the exception of the northbound on-ramp at the Birmingham Drive Interchange.

Coast Highway 101 (Highway 101) is classified as a Scenic Highway within the City of Solana Beach Circulation Element and as a Four-Lane Major road within the City of Encinitas Circulation Plan in the vicinity of the study area. From Lomas Santa Fe Drive to just north of West Cliff Street, Highway 101 is currently built as a three-lane roadway (two travel lanes northbound and one southbound) with a raised center median. This portion of the roadway is part of the recently implemented Highway 101 Westside Improvement Project which extends from Dahlia Drive to West Cliff Street. This project has facilitated the provision of pedestrian amenities, diagonal parking, a landscaped median, and bicycle “sharrows” among other improvements. The posted speed limit has been reduced to 35 mph in this area. A Class II bike lane is provided on the east side of the roadway and bus stops are provided.

North of West Cliff Street to Ocean Street, Highway 101 is built as a four-lane roadway divided by a landscaped raised median. North of Ocean Street to Chesterfield Drive, Highway 101 is built as a four-lane undivided roadway with posted speed limits between 45 mph and 50 mph. Class II bike lanes and bus stops are provided along both sides of the roadway. Curbside parking is intermittently allowed on the west side of the roadway. There are paved shoulders but no sidewalks are provided along this stretch of Highway 101. Traffic is controlled by signals at some driveways providing access to beach parking or businesses located along the highway; otherwise, spacing between signalized intersections is large.

Chesterfield Drive is an unclassified local road, currently built as a two-lane undivided roadway extending east from Highway 101 near the coast. Curbside parking is generally available but very restricted on some narrower blocks. The posted speed limit is 25 mph and sidewalks are generally available on at least one side of the roadway, west of Montgomery Avenue.

It should be noted that there is an at-grade crossing of Chesterfield Drive by the San Diego Northern Railway (SDNR), upon which the Coaster heavy-rail commuter line runs. The Coaster has 5 trains (3 southbound, 2 northbound) that run during the AM peak period of 7-9 AM. It operates 6 trains (3

northbound/3 southbound) during the PM peak period of 4-6 PM. Thus, during either peak hour, three or less crossings would occur, requiring interruption of standard signal timing for the intersections adjacent the crossing on Chesterfield Drive.

San Elijo Avenue is classified as a Local Collector. San Elijo Avenue is currently built as a two-lane undivided roadway with a speed limit of 25 mph. In the vicinity of the project area, curbside parking is provided near Chesterfield Drive but otherwise generally prohibited. Sidewalks are provided on the east side of the roadway, north of Dublin Drive.

Manchester Avenue from El Camino Real west to Interstate 5 is classified as a Prime Arterial in the City of Encinitas Circulation Plan. West of Interstate 5, Manchester Avenue is classified as a Local Collector in the City of Encinitas Circulation Plan.

The segment of Manchester Avenue between El Camino Real and Interstate 5 is currently constructed as a four-lane undivided roadway. The posted speed limit is 50 mph and a Class II bikeway is provided on either side of the roadway. Parking along the roadway is prohibited.

West of Interstate 5 to San Elijo Avenue, Manchester Avenue is currently constructed as a two-lane undivided roadway with a posted speed limit of 40 mph. Class II bike lanes are proposed along this segment. Curbside parking is generally not provided and there is an intermittent sidewalk along the north side of the roadway. Beyond San Elijo Avenue, Manchester Avenue becomes a local residential road with a 25 mph speed limit and curbside parking. It should be noted that a 7-ton truck weight limit sign is posted just west of the I-5 Southbound Ramps. It is anticipated that the project contractor will obtain a construction permit allowing a temporary weight limit increase along this portion of the roadway. Once construction is completed, the contractor may need to repair/resurface this roadway.

Lomas Santa Fe Drive is classified as a Major Arterial. It extends from Highway 101 near the coast eastward to the Solana Beach City limits. It provides four undivided travel lanes with bike lanes west of I-5. It forms a full-signalized diamond interchange at I-5. The speed limit is posted at 35 mph. It is signalized at most intersections. Lomas Santa Fe Drive contains a bike lane east of Stevens Avenue.

North Rios Avenue is classified as a Local Road in the City of Solana Beach Circulation Plan and runs from the edge of the San Elijo Lagoon in the north to Lomas Santa Fe Drive in the south. North Rios Avenue is currently built as a two-lane undivided roadway generally serving residences, the Solana Beach School District, and some commercial uses near Lomas Santa Fe Drive. The posted speed limit is 25 mph. Curbside parking is provided intermittently along either side of the roadway. Sidewalks are generally not provided except for north of Patty Hill Drive and immediately north of Lomas Santa Fe Drive.

3.2 Existing Traffic Volumes

Weekday AM/PM peak hour intersection turning movement counts were conducted for the following eight (8) study-area intersections in October 2012 while schools were in session. No major events (e.g. Fair or horse racing) were occurring at the Del Mar Fairgrounds at this time.

1. Chesterfield Drive/ Coast Highway 101 (signalized)
2. Chesterfield Drive/ San Elijo Avenue (signalized)
3. Manchester Avenue/ I-5 Southbound Ramps (unsignalized)
4. Manchester Avenue/ I-5 Northbound Ramps (signalized)
5. Lomas Santa Fe Drive/ Coast Highway 101 (signalized)
6. Lomas Santa Fe Drive/ Rios Avenue (signalized)
7. Lomas Santa Fe Drive/ I-5 Southbound Ramps (signalized)
8. Lomas Santa Fe Drive/ I-5 Northbound Ramps (signalized)

Bi-directional 24-hour segments counts were also conducted in October at the following ten (10) street segments in the study area. **Table 3–1** is a summary of the average daily traffic volumes (ADTs).

1. Coast Highway 101 just north of Chesterfield Drive
2. Coast Highway 101 just south of Chesterfield Drive (include Thurs-Sun, 5 days total)
3. Coast Highway 101 just north of Lomas Santa Fe Drive
4. Chesterfield Drive just east of Coast Highway 101
5. San Elijo Avenue just south of Chesterfield Drive
6. Manchester Avenue just west of the I-5 Southbound Ramps
7. Manchester Avenue just east of the I-5 Northbound Ramps
8. Rios Avenue just north of Lomas Santa Fe Drive
9. Lomas Santa Fe Drive just east of Coast Highway 101 (east of RR tracks)
10. Lomas Santa Fe Drive, Hilmen Drive to Stevens Avenue/Glencrest Drive
11. Lomas Santa Fe Drive, Solana Hills Drive to the I-5 Southbound Ramps

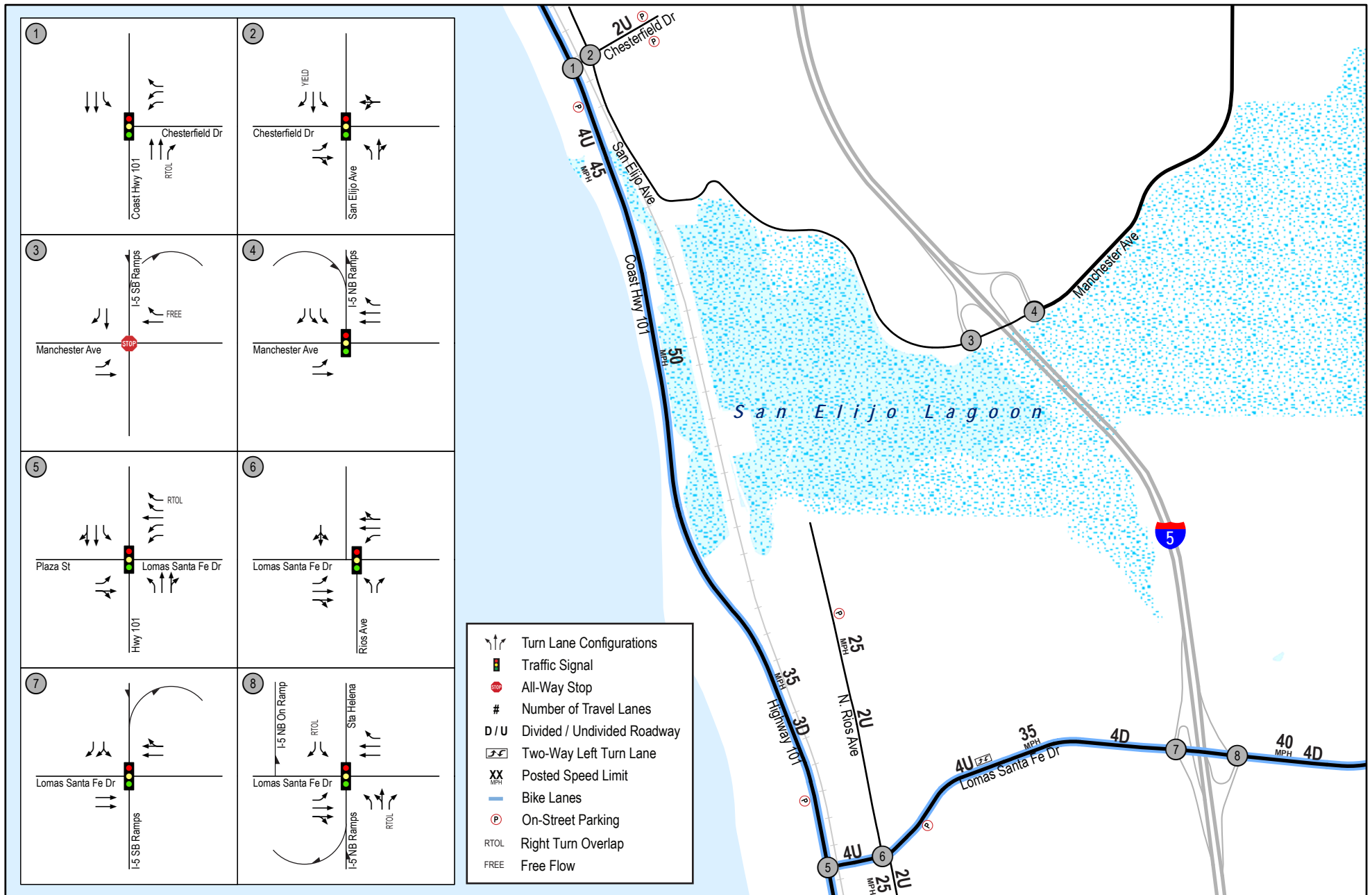
**TABLE 3-1
EXISTING TRAFFIC VOLUMES**

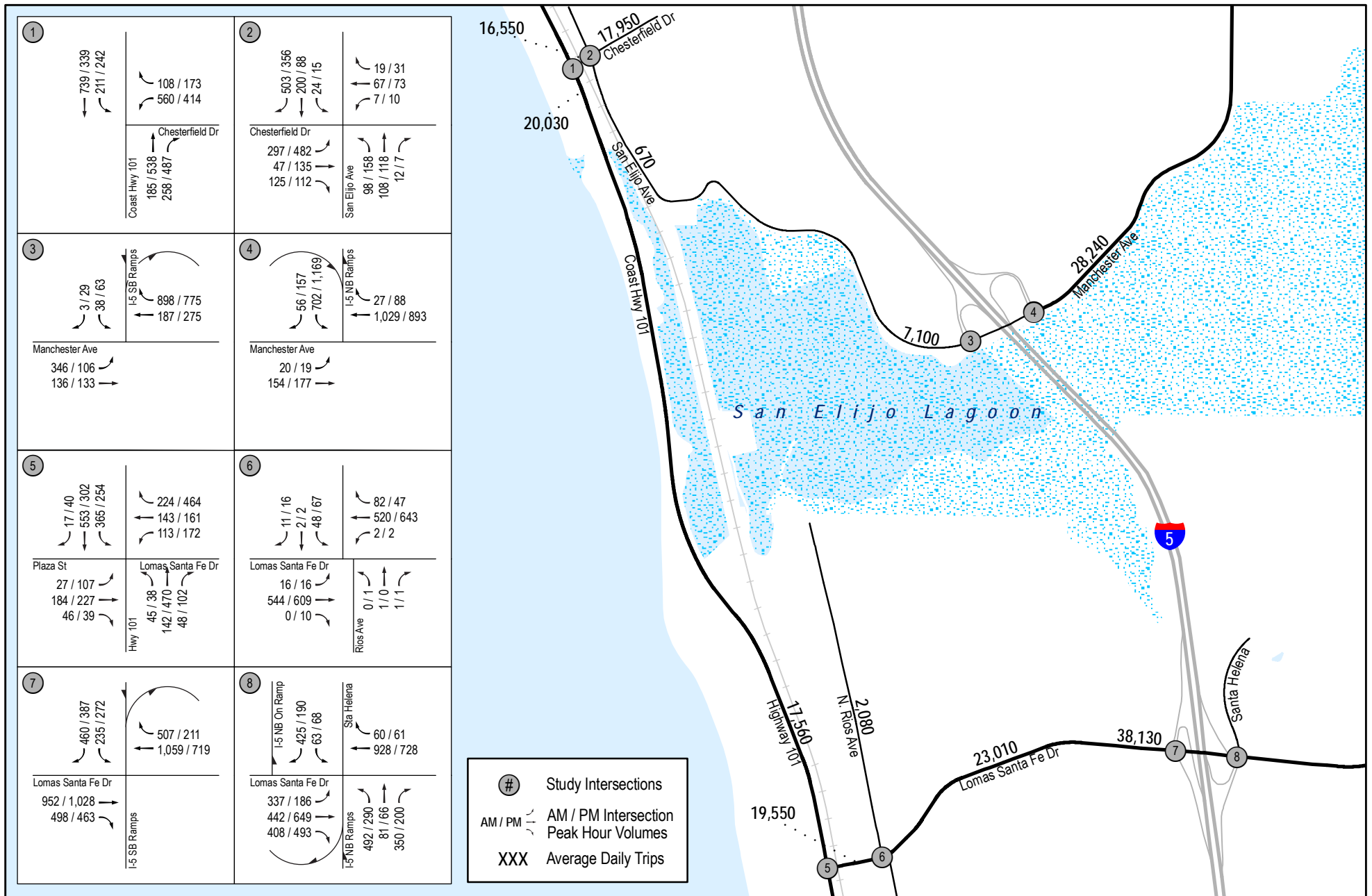
Street Segment	Jurisdiction	ADT ^a	Source ^b
Coast Highway 101			
North of Chesterfield Drive	Encinitas	16,550	LLG Engineers
South of Chesterfield Drive	Encinitas	20,130	LLG Engineers
North of Lomas Santa Fe Drive	Solana Beach	17,560	LLG Engineers
Chesterfield Drive			
East of Coast Highway 101	Encinitas	17,950	LLG Engineers
San Elijo Avenue			
South of Chesterfield Drive	Encinitas	670	LLG Engineers
Manchester Avenue			
West of I-5 Southbound Ramps	Encinitas	7,100	LLG Engineers
East of I-5 Northbound Ramps	Encinitas	28,240	LLG Engineers
Rios Avenue			
North of Lomas Santa Fe Drive	Solana Beach	2,080	LLG Engineers
Lomas Santa Fe Drive			
East of Coast Highway 101	Solana Beach	19,550	LLG Engineers
Hilmen Drive to Glencrest Drive/Stevens Avenue	Solana Beach	23,010	LLG Engineers
Solana Hills Drive to I-5 Southbound Ramps	Solana Beach	38,130	LLG Engineers

Footnotes:

- a. Average Daily Traffic Volumes.
- b. Counts were commissioned by LLG Engineers, and performed by Accurate Video Counts, Inc. (October 2012)

Figure 3-2 shows the existing traffic volumes. **Appendix A** contains the manual and machine-count sheets.





4.0 ANALYSIS APPROACH AND METHODOLOGY

4.1 Approach

This report analyzed the potential impacts associated with the short-term construction activity of the San Elijo Lagoon Restoration Project. Four project alternatives are under consideration, each with a different traffic impact potential.

The following are the traffic generating operational characteristics of the four project alternatives:

Dredging

Dredging of the lagoon would occur over all four phases of the project. This process is not expected to generate any daily truck traffic.

Vegetation Clearing

Vegetation clearing in advance of dredging would occur throughout each of the four phases. As much as 365,000 total cubic yards (cy) of waste material may need to be removed from the site (122,000 cy/phase on average). It is anticipated this would be done by 12-cy capacity rear dump trucks. Therefore, as many as 36,500 roundtrip truck trips may be generated by this activity over the entire construction period.

The haul route identified by the project team is the most proximate route to I-5, then to either Miramar or Oceanside waste sites. Much of the vegetation clearing appears to be on the north side of the lagoon, adjacent to Manchester Avenue. There is the potential for some vegetation removal traffic to affect the neighborhood north of Lomas Santa Fe Drive along North Rios Avenue.

Dike Construction

In addition to vegetation, the project would entail the construction and removal of a up to five (5) dikes. This effort is estimated to require 50,000 cubic yards of material that would most likely be taken from excess material generated by the Caltrans I-5 North Coast Corridor Project bridge replacement. Thus, off-site truck trips would not be associated with this activity.

Workers and Parking

A maximum of 20 to 40 daily employees are anticipated to work onsite five days a week (Monday through Friday) completing various tasks. There are ten planned locations for employee parking, generally onsite or in lots adjacent to Highway 101 and Manchester Avenue. The lots include state beach lots and it is not expected that employee parking would occur in local residential areas. A shuttle may be necessary for some of the more distant lots. Parking locations are expected to remain the same throughout the duration of the project.

Bridge Reconstruction and Detouring

The project would also demolish and replace Highway 101 where it bridges the mouth of the lagoon if Alternative 2A is implemented. This reconstruction would occur during Phases 1 through 3 of the overall project. Bridge reconstruction would occur in two parts, with each part resulting in the closure of one side of the highway, although two-way traffic is proposed to be maintained at all times. Bridge reconstruction is anticipated to take 18 months total, 10 months for the first phase and 8 months for the second. The bridge shall remain in service throughout the demolition and replacement period, with two-way traffic flow maintained at all times. As one side of the current four-lane bridge is closed and rebuilt, two-way traffic would be rerouted to the other side, with lane drops and detours across the median necessary on Highway 101 on either side of the bridge.

There are no plans to provide formal detour routes, since two-way traffic would continue to be maintained. However, it is expected that some through traffic on Highway 101 would divert to I-5, with the final opportunity to do so via Manchester Avenue in the north or Lomas Santa Fe Drive in the south.

Alternative 2A would result in the most potential effects on area circulation and traffic, due to the fact that it includes both vegetation clearing, and replacement of the existing bridge on Coast Highway 101. The former action generates truck trips to haul-off the cleared material, while the latter results in an approximate 50% reduction in roadway capacity during bridge reconstruction, as well as the redistribution of Coast Highway 101 trips to lateral roadways as they detour from the construction.

As discussed in Section 2.2.2, four sequential phases of construction are planned over a period of 36 months. This analysis evaluates a construction start date of late year 2016 with an overall 3-year construction period which allows for cumulative growth on the street system. For this analysis, Phase I of the project is scheduled to begin in Winter 2016, with Phase 4 project completing in Fall 2019. Phase 2 of the project would be the most intensive with respect to traffic (see Section 8), and therefore represents the “project” for the purposes of the analysis.

Thus, the following scenarios are analyzed in this report:

1. Existing
2. Pre-Construction
3. Construction Period (includes Alternative 2A, Phase 2 construction traffic)

It should be noted that because the analysis represents the worst-case phase of construction of the most intensive project alternative, any potential impacts associated with other construction phases/alternatives would not exceed those identified in this analysis.

4.2 Methodology

This traffic study presents capacity analyses of the key study area intersections and street segments. The roadway capacity is discussed quantitatively using the concept of “Level of Service (LOS)”. LOS denotes the different operating conditions which occur on a given roadway segment under

various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a segment or intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions.

4.2.1 Intersections

Signalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay was determined utilizing the methodology found in Chapter 16 of the *2000 Highway Capacity Manual (HCM)*, with the assistance of the *Synchro* (version 7) computer software. The delay values (represented in seconds) were qualified with a corresponding intersection Level of Service (LOS).

Unsignalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay and Levels of Service (LOS) was determined based upon the procedures found in Chapter 17 of the *2000 Highway Capacity Manual (HCM)*, with the assistance of the *Synchro* (version 7) computer software.

4.2.2 Street Segments

Street segments were analyzed based upon the comparison of daily traffic volumes (ADT) to either the published San Diego Traffic Engineers' Council (SANTEC) *Roadway Classifications, Levels of Service (LOS) and Average Daily Traffic (ADT)* table (Solana Beach), or the City of Encinitas' published *Roadway Capacity Standards* table, as appropriate. These tables provide segment capacities for different street classifications, based on traffic volumes and roadway characteristics. These tables are attached in **Appendix B**.

5.0 SIGNIFICANCE CRITERIA

5.1 SANTEC/ITE Guidelines

The cities of Encinitas and Solana Beach both utilize the published, regional SANTEC criteria for determining the significance of a project's traffic impacts. According to these criteria, a project is considered to have a significant impact if the new project traffic has decreased the operations of surrounding roadways by a defined threshold. The defined thresholds for roadway segments and intersections are defined in *Table 5-1*. If the project exceeds the thresholds in *Table 5-1*, then the project may be considered to have a significant project impact. A feasible mitigation measure will need to be identified to return the impact within the thresholds (pre-project + allowable increase) or the impact will be considered significant and unmitigated. These are also considered applicable to Caltrans facilities.

Ramp meter observations presented in this report reveal a large discrepancy between the calculated operations and actual conditions. Therefore, calculated ramp meter operations may not be an effective tool in determining project impacts or form a solid basis for identifying mitigation.

Table 5-1
SANTEC/ITE TRAFFIC IMPACT SIGNIFICANCE THRESHOLDS

Level of Service with Project ^a	Allowable Increase Due to Project Impacts ^b					
	Freeways		Roadway Segments		Intersections	Ramp Metering
	V/C	Speed (mph)	V/C	Speed (mph)	Delay (sec.)	Delay (min.)
D ^c , E & F (or ramp meter delays above 15 minutes)	0.01	1	0.02	1	2	2

1. Footnotes:

- All level of service measurements are based upon HCM procedures for peak-hour conditions. However, V/C ratios for Roadway Segments may be estimated on an ADT/24-hour traffic volume basis (using Table 2 or a similar LOS chart for each jurisdiction). The acceptable LOS for freeways, roadways, and intersections is generally "D" ("C" for undeveloped or not densely developed locations per jurisdiction definitions). For metered freeway ramps, LOS does not apply. However, ramp meter delays above 15 minutes are considered excessive.
- If a proposed project's traffic causes the values shown in the table to be exceeded, the impacts are deemed to be significant. These impact changes may be measured from appropriate computer programs or expanded manual spreadsheets. The project applicant shall then identify feasible mitigations (within the Traffic Impact Study [TIS] report) that will maintain the traffic facility at an acceptable LOS. If the LOS with the proposed project becomes unacceptable (see note a above), or if the project adds a significant amount of peak hour trips to cause any traffic queues to exceed on- or off-ramp storage capacities, the project applicant shall be responsible for mitigating significant impact changes.
- The cities of Encinitas accepts LOS D operations, regardless of project increase in V/C, delay, etc., whereas the City of Solana Beach considers LOS D to have the same allowable increases as LOS E/LOS F. The analysis tables define the jurisdiction of each location.

2. General Notes:

- V/C = Volume to Capacity Ratio
- Speed = Arterial speed measured in miles per hour
- Delay = Average stopped delay per vehicle measured in seconds for intersections, or minutes for ramp meters.
- LOS = Level of Service
- There are alternative methods of freeway and roadway analyses using "speed" that are not applicable to this study; therefore, the thresholds related to these methods have been shown in half-tone.

6.0 ANALYSIS OF EXISTING CONDITIONS

The following is a summary of the capacity analysis for the existing condition in the study area.

6.1 Peak Hour Intersection Levels of Service

Table 6–1 summarizes the existing peak hour signalized and unsignalized intersection operations. *Table 6–1* shows that all the study area intersections currently operate at LOS D or better.

6.2 Existing Operations—Daily Street Segment Operations

Table 6–2 summarizes the existing roadway segment operations. As seen in *Table 6–2*, all the study area roadway segments are calculated to currently operate at LOS C or better on a daily basis except for the following location which is calculated to operate at LOS E:

- Lomas Santa Fe Drive – Solana Hills to I-5, LOS E

Appendix C contains the HCM intersection analysis worksheets.

**TABLE 6-1
EXISTING INTERSECTION OPERATIONS**

Intersection	Control Type	Peak Hour	Existing	
			Delay ^a	LOS ^b
1. Chesterfield Drive/ Coast Highway 101 ^c	Signal	AM PM	20.2 27.2	C C
2. Chesterfield Drive/ San Elijo Avenue ^c	Signal	AM PM	23.3 21.7	C C
3. Manchester Avenue/ I-5 Southbound Ramps	AWSC ^d	AM PM	17.5 12.4	C B
4. Manchester Avenue/ I-5 Northbound Ramps	Signal	AM PM	18.5 23.6	B C
5. Lomas Santa Fe Drive/ Coast Highway 101	Signal	AM PM	28.6 33.4	C C
6. Lomas Santa Fe Drive/ Rios Avenue	Signal	AM PM	10.8 11.8	B B
7. Lomas Santa Fe Drive/ I-5 Southbound Ramps	Signal	AM PM	20.0 19.6	C B
8. Lomas Santa Fe Drive/ I-5 Northbound Ramps	Signal	AM PM	49.2 29.0	D C

Footnotes:

- a. Average delay expressed in seconds per vehicle.
- b. Level of Service.
- c. LOS/Delay represent non-railroad affected signal timing.
- d. AWSC – All Way Stop Controlled intersection.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 6-2
EXISTING STREET SEGMENT OPERATIONS

Street Segment	Jurisdiction	Classification	Capacity (LOS E) ^a	ADT ^b	LOS ^c	V/C ^d
Coast Highway 101						
North of Chesterfield Drive	Encinitas	Major Road	35,200	16,550	A	0.470
South of Chesterfield Drive	Encinitas	Major Road	35,200	20,130	A	0.572
North of Lomas Santa Fe Drive	Solana Beach	Modified Major Arterial ^e	30,000	17,560	C	0.585
Chesterfield Drive						
East of Coast Highway 101	Encinitas	Collector Road	32,400	17,950	A	0.554
San Elijo Avenue						
South of Chesterfield Drive	Encinitas	Local Road – Augmented	20,000	670	A	0.034
Manchester Avenue						
West of I-5 Southbound Ramps	Encinitas	Local Road – Augmented	20,000	7,100	A	0.355
East of I-5 Northbound Ramps	Encinitas	Collector Road	32,400	28,240	D	0.872
Rios Avenue						
North of Lomas Santa Fe Drive	Solana Beach	Local Street	8,000	2,080	A	0.260
Lomas Santa Fe Drive						
East of Coast Highway 101	Solana Beach	Major Arterial	40,000	19,550	B	0.489
Hilmen Drive to Stevens Avenue	Solana Beach	Major Arterial	40,000	23,010	C	0.575
Solana Hills Drive to I-5	Solana Beach	Major Arterial	40,000	38,130	E	0.953

Footnotes:

- a. Capacities based on the City of Encinitas and City of Solana Beach roadway classification table.
- b. Average Daily Traffic Volumes.
- c. Level of Service.
- d. Volume to Capacity.
- e. Coast Highway 101 north of Lomas Santa Fe Drive is constructed with one lane in the southbound direction and two lanes in the northbound direction separated by a landscaped raised median. Therefore, a modified capacity of 30,000 ADT for a 4-Lane Major Arterial was used in the analysis.

7.0 CUMULATIVE PROJECTS

There are other planned projects in the areas adjacent to the study area, which could add traffic to the roadways surrounding the project location. Research was conducted at the City of San Diego, County of San Diego, and Cities of Solana Beach and Del Mar to determine projects within the study area that should be included in the cumulative analysis. All projects located along the Via De La Valle corridor (within the study area) were included in the cumulative analysis. Based on the research conducted, it was determined that 41 specific cumulative development projects should be included in the analysis. It should be noted that the following list has been updated from a previously prepared list of cumulative development projects dating back to 2008. It was then determined from this list of 40 cumulative projects which projects have been built, are no longer proposed, or are new projects. Previously included cumulative traffic volumes from past cumulative projects that have been constructed are represented in the on-the-ground traffic volumes collected in April 2011 and June 2012 and therefore, would not be included in the cumulative project analysis. Cumulative projects, for the purpose of assessing traffic impacts, include projects currently under construction and future proposed projects. Past projects are included in the existing traffic volumes. The following is a brief description of these cumulative projects.

Figure 7-1 depicts the cumulative project traffic volumes and *Figure 7-2* shows the “Pre-Construction” (existing + cumulative) traffic volumes in the study area.

7.1 Description of Projects

CITY OF SAN DIEGO

1. **Flower Hill Promenade** is currently under construction to redevelop a portion of the Flower Hill Promenade located on the north side of Via De La Valle just east of I-5 in the City of San Diego. The existing promenade consists of a 14,000 SF theater and 98,116 SF of retail/restaurant space. The promenade is currently adding approximately 8,754 SF of retail space, 2,300 SF of storage space, 28,927 SF of office space, and a 35,000 SF market. The removal of the movie theater has been completed. The project is calculated to generate approximately 3,179 daily trips with 227 trips (175 inbound / 52 outbound trips) during the AM peak hour and 367 trips (137 inbound / 230 outbound trips) during the PM peak hour once completed. LLG prepared the traffic study for this project in November 2010.

As of the date of this most recent version of the traffic report, this project has been completed and is currently operational. However, at the time of the collection of existing traffic volume data collection, this project was not yet constructed. Therefore, traffic generated by Flower Hill Promenade was included in the cumulative condition.

2. **Rancho Del Mar** is a proposal to construct 225 senior citizen housing dwelling units. The proposed project site is located on the southeast corner of Via De La Valle and El Camino Real (West). The project is calculated to generate 900 ADT with 14 trips

inbound and 58 trips outbound during the AM peak hour, and 63 trips inbound and 27 trips outbound during the PM peak hour.

3. **San Diego Corporate Center Lots** is a proposal to construct 250,000 SF of corporate office and 100,000 SF of retail commercial. The project site is located in the community of Carmel Valley near Del Mar Heights Road and El Camino Real. At full buildout, the project is calculated to generate 26,270 ADT with 1,144 trips inbound and 500 trips outbound during the AM peak hour, and 1,189 trips inbound and 1,678 trips outbound during the PM peak hour.
4. **El Camino Real Widening Project** (City of San Diego Capital Improvement Project 52-479.0) proposes the widening of the existing two-lane El Camino Real roadway to a modified four-lane major street between San Dieguito Road and Via De La Valle, which also includes the reconstruction and widening of the existing two-lane bridge to a four-lane bridge. In addition, the project includes the widening of Via De La Valle between El Camino Real (West) and El Camino Real (East) to four lanes, improvements on El Camino Real (East) and improvements to the Via De La Valle / El Camino Real (West) intersection. The intersection will be improved and potentially shifted eastward.
5. **Via De La Valle Widening Project** (Black Mountain Ranch Facilities Financing Plan Project No. T-32). The widening of Via De La Valle from El Camino Real (West) to San Andres Drive is part of the City of San Diego, Black Mountain Ranch Facilities Financing Program. The project includes adding two travel lanes. The Flower Hill Promenade Redevelopment project was mandated by the City of San Diego to pay the full funding amount toward this widening as direct mitigation for impacts to Via De La Valle.
6. **Via De La Valle Townhomes** is a proposal to construct 22 townhomes on 18.8 acres. The proposed project site is located on the north side of Via De La Valle, easterly of San Andres Drive, and west of the 19-unit PRD known as Santa Fe Downs. The project is calculated to generate approximately 176 ADT with 3 inbound and 11 outbound trips during the AM peak hour, and 13 inbound and 5 outbound trips during the PM peak hour.

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7. **Palma de la Reina** proposes to construct 19,500 SF of office, 9,559 SF of local-serving retail, and 54 apartment units. The project is calculated to generate 1,210 ADT, with 64 inbound/38 outbound trips during the AM peak hour, and 62 inbound/72 outbound trips during the PM peak hour. LLG prepared the traffic study for this project in August 2011.
8. **TPM 20479** is a proposed 2-unit estate housing development on a 5.01-acre lot. The project is located on 6225 San Elijo Rd. This project is calculated to generate 24 ADT with 1 inbound and 1 outbound trip during the AM peak hour and 2 inbound and 1

outbound trips during the PM peak hour. Traffic data for this project was manually derived from the SANDAG (*Not So*) *Brief Guide of Vehicular Traffic Generation Rates*, April 2002 for estate housing.

9. **TPM 20612** is a proposed 4-unit estate housing development on a 10.0-acre lot. The project is located south of Aliso Canyon Road. This project is calculated to generate 48 ADT with 1 inbound and 3 outbound trips during the AM peak hour and 3 inbound and 1 outbound trips during the PM peak hour. Traffic data for this project was manually derived from the SANDAG (*Not So*) *Brief Guide of Vehicular Traffic Generation Rates*, April 2002 for estate housing.
10. **TM 4821** is a proposed 10-unit estate housing development on a 21.82-acre lot. The project is located on the north side of Avenida Del Duque. This project is calculated to generate 120 ADT with 3 inbound and 7 outbound trips during the AM peak hour and 8 inbound and 4 outbound trips during the PM peak hour. Traffic data for this project was manually derived from the SANDAG (*Not So*) *Brief Guide of Vehicular Traffic Generation Rates*, April 2002 for estate housing.
11. **Rancho Santa Fe Community Services District Water Treatment Facility** is located at the existing RSF CSD Water Reclamation Facility on Via de Santa Fe, east of Via De La Valle, north of Calzada del Bosque, and south of Paseo Delicias in Rancho Santa Fe in the County of San Diego. The proposed project will consist of expanding or modifying a portion of the existing yard piping. The project will also require construction of an additional aeration basin, an additional sedimentation basin, a new internal recycling pump station and new return sludge pumps. All project components would be constructed within the existing treatment facility property. The improvements are anticipated to take approximately six to eight months to construct. Once the site has been improved, traffic volumes and patterns will return to pre-construction levels. It is for this reason that the construction traffic volumes were not included in the analyses. The total construction traffic is calculated to generate 93 ADT with 18 inbound and 5 outbound trips during the AM peak hour, and 5 inbound and 18 outbound trips during the PM peak hour. Traffic data for this project were obtained from the traffic study conducted by LLG Engineers (October 2005).
12. **Del Mar Country Club Estates** is a proposed subdivision of 5.47 acres into two single-family residential lots. The project is located to the east of Heritage Hills between Emerald Lane and Rancho Santa Farms in the County of San Diego. The project is expected to generate 24 daily trips, 1 inbound and 1 outbound AM peak hour trips and 2 inbound and 1 outbound peak hour trips. The trip generation rate for this cumulative project was derived from the SANDAG (*Not So*) *Brief Guide of Vehicular Traffic Generation Rates*, April 2002.

13. **Del Mar Country Estates** is a proposed development of 14 estate homes to be located in the vicinity of Rancho Santa Fe Road and Rancho Diegueno Road. The project is expected to generate 168 daily trips, 4 inbound and 9 outbound AM peak hour trips and 12 inbound and 5 outbound peak hour trips. The trip generation rate for this cumulative project was derived from the SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates, April 2002.
14. **Village Community Presbyterian Church** is located at 6225 Paseo Delicias in the San Dieguito Community Planning Group, within unincorporated San Diego County. The project proposes to convert an existing 2,940 SF single-family residence on an adjacent parcel into a meeting space for youth to be used in connection with the church. Several additional design modifications have been approved over the years. The total existing and proposed build out for the church uses will be 47,992 SF of building space on 8.11 acres. Construction is currently in progress to expand the church to build out specifications. Therefore, a net trip generation was used in the cumulative condition. The proposed project is expected to generate 75 daily trips with 4 trips during the AM peak hour and 6 trips during the PM peak hour. The trip generation rate for this cumulative project was derived from the SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates, April 2002.
15. **Osuna Ranch** proposes the subdivision of one parcel into two separate legal lots to permit an equestrian facility on 22.49 acres located at 16332 Via de Santa Fe in the San Dieguito Community Planning Group, within unincorporated San Diego County. The existing structures will remain on the site, including the historic Osuna Adobe as well as an existing single-family residence on Parcel 1.
16. **TPM 21065** proposes to subdivide 5.88 acres into two lots for single-family home use. The project is currently developed with one single family residence, pool, and existing tennis courts. The project site is located on 17403 Rancho Del Rio in the San Dieguito Community Planning Group, within unincorporated San Diego County. The subject property is zoned RR.5 Rural Residential and S80 Open Space Use Regulations with a minimum lot size of 2 acres. The site also has existing tennis courts which may be replaced for a proposed building pad for parcel 2. The proposed project is expected to generate 20 daily trips with 2 trips during the AM peak hour and 2 trips during the PM peak hour. The trip generation rate for this cumulative project was derived from the SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates, April 2002.
17. **AD2DU 10-049** (Administrative Permit) proposes an approximately 1,200 SF second dwelling unit, which will replace an existing 600 SF accessory structure, and an approximately 537 SF addition to the existing 330 SF detached garage, which provides parking for the second dwelling unit. Zoning for the site is RS1, Residential. The site contains an existing 2,536 SF single family residence with a 675 SF attached garage, a 330 SF detached garage, and a 600 SF accessory structure. All structures will be retained

except for the accessory structure. No additional traffic is expected to be generated by the proposed permit.

18. **TM 5406** is an approved condominium development consisting of 6 multi-family residences located on the southeast corner of the Via de Santa Fe and Paseo Arbolado intersection. This project is calculated to generate 48 ADT with 4 trips during the AM peak hour and 5 trips during the PM peak hour. The trip generation rate for this cumulative project was derived from the SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates, April 2002.
19. **Rancho Santa Fe Roundabouts** is a project proposed by the County of San Diego to construct roundabouts at the intersections of Via De La Valle/Paseo Delicias, Paseo Delicias/El Montevideo/La Valle Plateada, and Paseo Delicias/El Camino del Norte/Del Dios Highway. The objective of the proposed project is to construct roundabouts along Paseo Delicias to ease existing traffic congestion at three intersections primarily caused by through traffic traveling eastbound and westbound during the morning and evening peak commuter periods. Based on a traffic study prepared by LLG in June 2008, it was determined that roundabouts at the three subject intersections would improve Level of Service (LOS) for these intersections during peak hours. Funding is currently unavailable for this project and there is no schedule for construction. Environmental studies are currently being conducted.
20. **TM 5182 (Cielo del Norte)** is an approved 186 single-family development located near the intersection of Elfin Forest Road and Harmony Grove Road. The project is expected to generate 2,232 daily trips, 54 inbound and 125 outbound AM peak hour trips and 162 inbound and 70 outbound peak hour trips. The trip generation for this project was obtained from the traffic study for the Cielo del Norte FEIR, certified by the Board of Supervisors on December 3, 2003.
21. **Bridges at Rancho Santa Fe** is a proposed residential project consisting of 35 estate homes. The project is located north of Avenida del Durque, between Bumann Road and Via de las Flores within and adjacent to the Bridges at Rancho Santa Fe Specific Plan Area. The project is expected to generate 420 daily trips, 10 inbound and 24 outbound AM peak hour trips and 29 inbound and 13 outbound peak hour trips. Urban Systems Associates completed the traffic study for this project in October 2004.
22. **The Helen Woodward Animal Center** provides pet and equine care and hospitalization; pet boarding; animal education; pet adoption; and therapeutic riding for physically and mentally disabled people. The site is located on the south side of El Apajo, west of San Dieguito Road in Rancho Santa Fe, San Diego County. The site is approximately 11.9 acres and includes equine stalls, stables, a small animal hospital, kennels, administration and education buildings, and other related uses. The day-to-day activities occurring on the site are not expected to change with the expansion of the facility. The proposed

- project consists of the phased rebuilding of the existing facility from approximately 108,500 SF to approximately 154,000 SF. While the total project expansion equates to 45,500 additional SF of space, the actual traffic-generating space represents an increase of 41,600 SF. The project is calculated to generate 594 ADT with 34 inbound and 12 outbound AM peak hour trips, and 12 inbound and 25 outbound PM peak hour trips. The traffic study for this project was completed by LLG, Engineers (April 2005).
23. **TPM 20593** is a proposal to legalize 2 single-family lots at 4519 South Lane. The proposed project is expected to generate 20 daily trips with 2 trips during the AM peak hour and 2 trips during the PM peak hour.
 24. **TPM 20354** is a proposed single-family lot and a parking lot for the existing health care facility located on the northeast corner of the El Camino Real (East) / Via De La Valle intersection. Since the health care facility exists today, there will be no additional traffic generated by the new parking lot. However, the single family home is expected to generate 10 daily trips, with 1 trip during the AM peak hour and 1 trip during the PM peak hour.
 25. **TPM 20693** is a proposal to subdivide a 4.12-acre lot on Via de Fortuna in Rancho Santa Fe into two residential parcels. The project is calculated to generate approximately 20 ADT with 2 outbound AM peak hour trips, and 2 inbound PM peak hour trips. The trip generation rate for this cumulative project was derived from the SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates, April 2002.
 26. **TPM 20721** is a proposal to subdivide a 6.12-acre lot on La Brisa in Rancho Santa Fe into two residential parcels. Two residences currently exist on the site and the lot split will facilitate providing each home with its own lot. The project is thus not expected to generate any additional traffic.
 27. **TPM 20326** is a proposal to subdivide a 4.4-acre lot on Paseo Delicias in Rancho Santa Fe into two residential parcels. The project is calculated to generate approximately 20 ADT with 2 outbound AM peak hour trips, and 2 inbound PM peak hour trips. The trip generation rate for this cumulative project was derived from the SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates, April 2002.
 28. **TPM “San Elijo”** is a proposal to subdivide a 5.01-acre lot on San Elijo in Rancho Santa Fe into two residential parcels. Two dwelling units and a guesthouse currently exist on the site and the lot split will facilitate providing each home with its own lot (and remove the existing guest hours). The project is thus not expected to generate any additional traffic.
 29. **TPM 20477** is a proposal to subdivide a 9.92-acre lot on Via de las Flores in Rancho Santa Fe into three residential parcels. The project is calculated to generate approximately 30 ADT with 3 outbound AM peak hour trips, and 3 inbound PM peak

- hour trips. The trip generation rate for this cumulative project was derived from the SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates, April 2002.
30. **TPM 20612** is a proposal to subdivide a 10.0-acre lot south of Aliso Canyon Road in Rancho Santa Fe into four residential parcels. The project is calculated to generate approximately 40 ADT with 4 outbound AM peak hour trips, and 4 inbound PM peak hour trips. The trip generation rate for this cumulative project was derived from the SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates, April 2002.
 31. **TPM 20893** is a proposal for a boundary adjustment and the subdivision of a 39.42-acre lot on El Camino del Norte in Rancho Santa Fe into four residential parcels with one parcel remaining. The project is calculated to generate approximately 40 ADT with 4 outbound AM peak hour trips, and 4 inbound PM peak hour trips. The trip generation rate for this cumulative project was derived from the SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates, April 2002.
 32. **TM 5125** is a proposal to subdivide a 13.01-acre lot on Via Cuatro Caminos in Rancho Santa Fe into six residential parcels. The project is calculated to generate approximately 60 ADT with 6 outbound AM peak hour trips, and 6 inbound PM peak hour trips. The trip generation rate for this cumulative project was derived from the SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates, April 2002.
 33. **MUP 91 019** is a proposal to subdivide a 34.9-acre lot on Avenida del Duque in Rancho Santa Fe into ten residential parcels. The project is calculated to generate approximately 120 ADT with 3 inbound and 7 outbound AM peak hour trips, and 8 inbound and 4 outbound PM peak hour trips. The trip generation rate for this cumulative project was derived from the SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates, April 2002.
 34. **TM 5148** is a proposal to subdivide a 28.62-acre lot on Aliso Canyon in Rancho Santa Fe into twelve residential parcels. The project is calculated to generate approximately 144 ADT with 3 inbound and 8 outbound AM peak hour trips, and 10 inbound and 4 outbound PM peak hour trips. The trip generation rate for this cumulative project was derived from the SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates, April 2002.
 35. **MUP 00 005** is a proposed recreation center to serve the residents of the Rancho Cielo Specific Plan Area. The center will consist of a 4,240 SF building and 4,680 SF of outdoor uses for a total of 8,920 SF. The project is calculated to generate approximately 50 ADT with 1 inbound and 1 outbound AM peak hour trips, and 3 inbound and 3 outbound PM peak hour trips. The trip generation rate for this cumulative project was derived from the SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates, April 2002.

36. **TM 5073** is a proposal to widen two portions of Del Dios Highway by 10 feet in order to provide for the construction of acceleration and deceleration lanes. This project is not expected to generate traffic.

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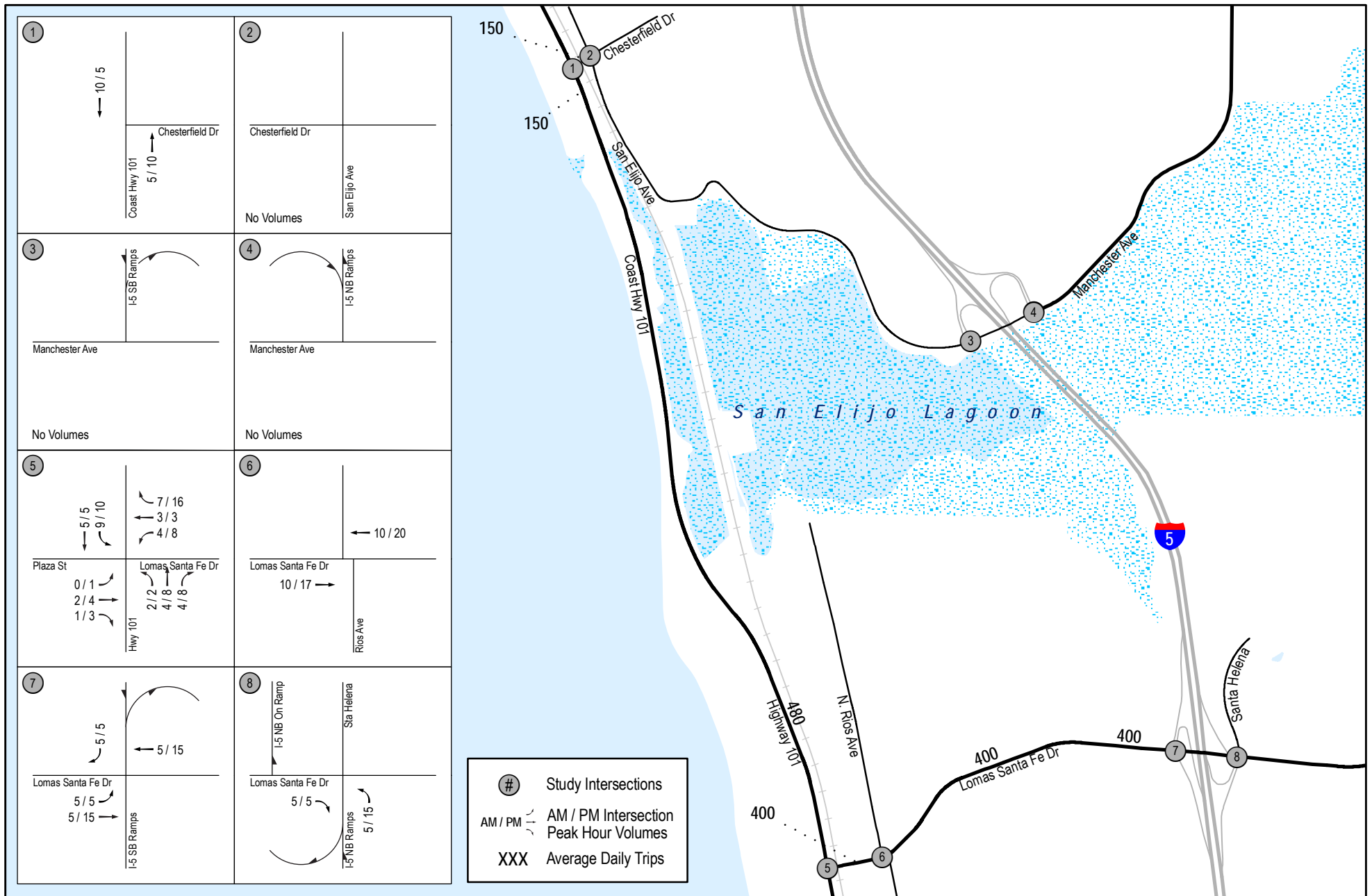
37. **The 22nd District Agricultural Association Master Plan Update** project is a proposal to expand uses at the existing Del Mar Fairgrounds/Racetrack property. The portions of the Master Plan, which are considered to be traffic generating components, include a 47,000 SF increase of the Flat Floor exhibit, a 30,000 SF health Club, and previously, a conference hotel (300 rooms). A project alternative without the hotel was approved by the 22nd DAA Board of Directors in 2012. Therefore, the trip assignment for this project utilized in this report overstates the volumes, since it includes trips for the hotel. The trip generation for the original project as proposed was 5,030 ADT with 199 inbound and 111 outbound trips during the AM peak hour, and 265 inbound and 165 outbound trips during the PM peak hour. A traffic study for this project was completed by LLG, Engineers (May 2007).
38. **Riverview Project** is a proposal to construct two commercial office buildings totaling 23,120 SF. The proposed project site is located at the southeast corner of Jimmy Durante Boulevard and San Dieguito Drive. It is calculated that the project will generate 560 ADT, with 66 inbound/ 7 outbound trips during the AM peak hour and 16 inbound/ 62 outbound trips during the PM peak hour.

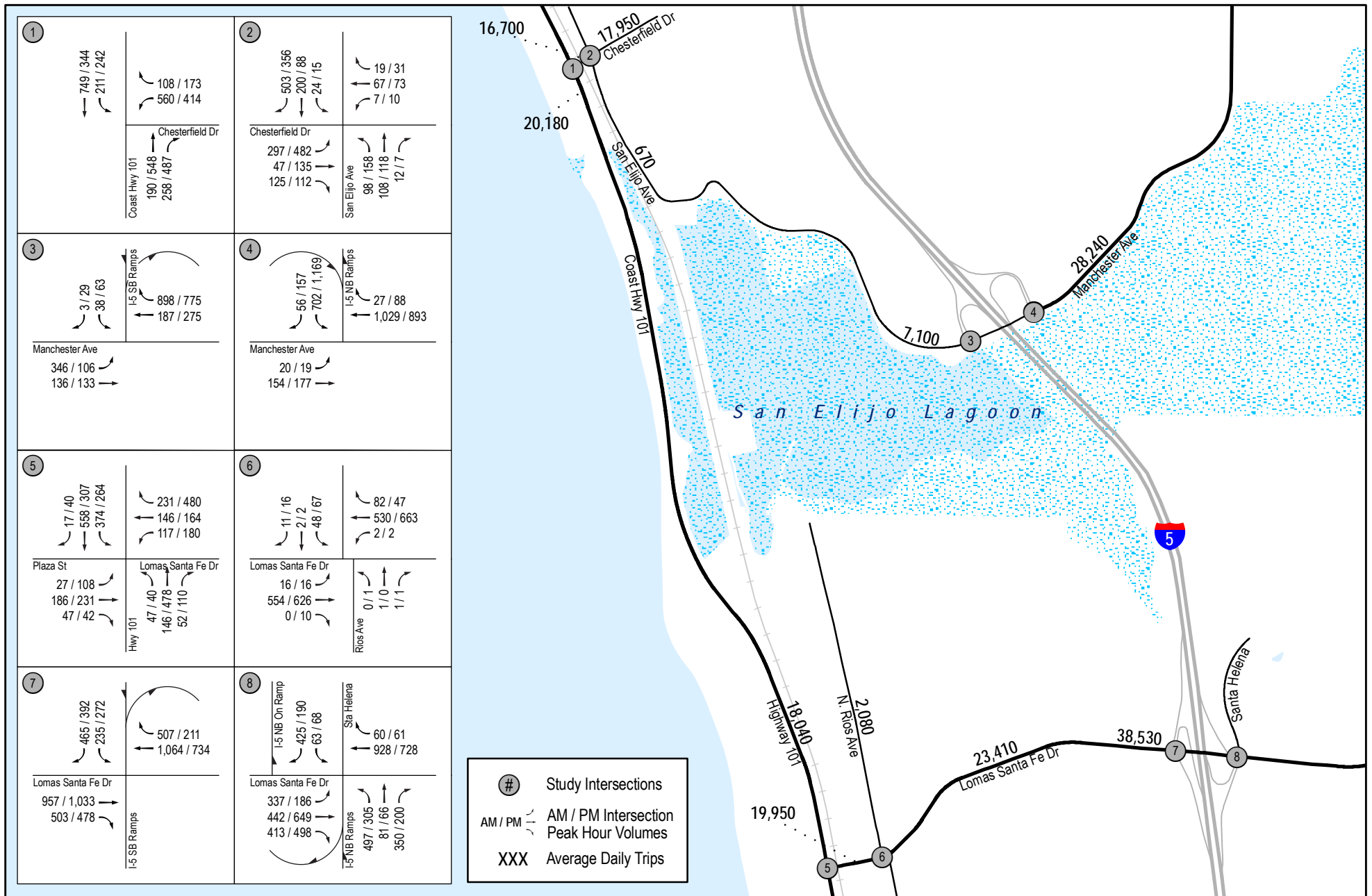
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39. **Solana Corporate Center** is an 18,905 SF two-story office building that is currently under construction on the southeast corner of the Stevens Avenue and Academy Drive intersection. The project is calculated to generate approximately 380 ADT with 48 inbound and 5 outbound trips during the AM peak hour, and 10 inbound and 39 outbound trips during the PM peak hour.
40. **The Villages at Lomas Santa Fe Plaza** is a proposal to construct 45,500 SF of commercial on the southern portion of the existing Lomas Santa Fe Plaza shopping center. The site is located on the southern portion of the Lomas Santa Fe Plaza shopping center in Solana Beach, east of I-5, south of Lomas Santa Fe Drive and between Marine View Avenue and Las Banderas Drive. It is important to note that the project is not scheduled to open until after the northbound ramps component of the I-5/Lomas Santa Fe interchange reconstruction has been completed. Phase 1 of the interchange improvements would only improve the northbound ramps of the interchange. It is calculated that the project will generate 1,547 ADT, with 33 inbound/22 outbound trips during the AM peak hour and 82 inbound/82 outbound trips during the PM peak hour.

41. **Highway 101 Westside Improvement Project** is a pedestrian and bicycle circulation improvement project to promote traffic calming, safe pedestrian mobility, and business vitality in the Highway 101 corridor in Solana Beach. Highway 101 will remain a four-lane roadway after completion of these improvements. The project's extents are between Dahlia Drive and Cliff Street in the City of Solana Beach. No new trips would result from the proposed street improvements.

Figure 7-1 shows the total cumulative traffic volumes. *Figure 7-2* shows pre-construction volumes.





8.0 TRIP GENERATION/DISTRIBUTION/ASSIGNMENT

8.1 Trip Generation

Phase 2 of the project's four phases would be expected to generate the maximum amount of construction traffic, as it would include the majority of the material hauled off-site during vegetation clearing, the dredging of the lagoon itself, and also the bridge replacement construction and de facto traffic rerouting. LLG worked with the project's civil engineer to understand and estimate the operational effects of these components to determine the daily and peak hour trip generation. The following is a summary of each component's characteristics within Phase 2, and the trip generation assumptions made regarding each.

Project Components

Vegetation Clearing

This activity would occur in advance of dredging for all four (4) phases of the project. As much as 365,000 cubic yards (cy) of vegetation material would be removed from the site, using 12-cy capacity dump trucks. The majority of material (300,000 cy) is assumed to be removed during Phase 2.

Phase 2 has an operational timeline of seven (7) months. The amount of time needed for vegetation removal is approximately 172 working days. It is anticipated that seven (7) dump trucks are available each day to remove vegetation from the site. Assuming 172 working days to remove 300,000 cy of material using 7 dump trucks each with a 12 cy capacity, the average number of one-way trips per day would be calculated as follows:

$$\begin{array}{rclcl} 300,000 \text{ cy} & \div & 12 \text{ cy/truck} & = & 25,000 \text{ truckloads} \\ 25,000 \text{ truckloads} & \div & 172 \text{ days} & = & 146 \text{ truckloads/day} \\ 146 \text{ truckloads/day} & \div & 7 \text{ trucks} & = & 21 \text{ one-way truck trips} \end{array}$$

Each truck trip would be multiplied by a factor of two (2) to represent the inbound loading trip and the outbound haul trip (two-way trip). A Passenger Car Equivalence Factor of 3.0 would also be applied to the trip to represent the fact that heavy vehicles have an additional effect on traffic flow as compared to passenger cars and light trucks due to their diminished handling characteristics. The hourly average of overall daily truck trips was utilized to determine the AM and PM peak hour trips. This average was divided in two to represent the inbound and outbound average during the hour. Assuming a 10-hour work day, this would account for about two (2) one-way truck trips per hour per day.

The anticipated daily haul trips would be 126 PCE average daily trips (ADT) with approximately 14 AM¹ peak hour (7 inbound/7 outbound) and 14 PM¹ peak hour (7 inbound/7 outbound) PCE trips. The calculations are shown below:

$$\begin{array}{rclcl} 21 \text{ one-way truck trips} & \times & 2.0 & = & 42 \text{ two-way truck trips} \\ 42 \text{ two-way truck trips} & \times & 3.0 \text{ PCE} & = & 126 \text{ two-way PCE truck trips} \end{array}$$

¹ 126 ÷ 10 = 12.6. Peak hour volume rounded up to the nearest even number for equal in/out trips.

$$\begin{array}{rclclcl}
 126 \text{ PCE truck trips} & \div & 10 \text{ hours} & = & 14 \text{ trips/hour}^1 \\
 14 \text{ trips/hour} & \div & 2 \text{ (in/out)} & = & 7 \text{ in/7 out trips/hour}
 \end{array}$$

Dike Construction and Removal

The construction and removal of temporary dikes would occur during all four (4) phases of the project. Approximately 50,000 cy of material will be needed for this activity. The material is proposed to be generated from the lagoon by either excavation along the utility road and/or proposed dike footprint, or by obtaining the material from Caltrans as surplus from the I-5 North Coast Corridor Project bridge replacement. No off-site hauling of material is anticipated with this activity. Therefore, no truck trips would occur. Since the specific number of workers associated with the dike construction is unknown at this time, the total number of workers expected on any given day was assumed to account for dike-related activities. Worker assumptions are discussed later on in this section.

Dredging

The actual dredging of the lagoon would occur over all four (4) phases of the project, after removal of the vegetation and in combination with the construction of dikes. The dredged material is to be carried away from the site via pipeline, so no truck trips would occur. Since the specific number of workers associated with the dredging is unknown at this time, the total number of workers expected on any given day was assumed to account for dredging-related activities. Worker assumptions are discussed later on in this section.

Bridge Replacement

The project would also demolish and replace Highway 101 where it bridges the mouth of the lagoon. Bridge reconstruction would occur in two parts. One side of the four-lane highway would be closed for construction and traffic would be re-routed and reduced to one lane in either direction on the remaining side. Upon completion of the first side of the bridge, traffic would be routed onto the new side of the highway and construction would begin on the remaining span. Two-way traffic would be maintained at all times.

Bridge reconstruction is anticipated to take 18 months total, 10 months for the first phase and 8 months for the second. The schedule is based on five (5) work days per week (average of 20 workdays per month) and eight (8) work hours per day. This would overlap with Phases 1 through 3, hence the conclusion that Phase 2 is most traffic intensive.

Replacement of the bridge would involve demolition and construction aspects; both of which would be variable in terms of worker and truck traffic generation. Information provided by the applicant indicates an estimated 240 two-way concrete delivery truck trips, 200 two-way other delivery-type truck trips, 600 two-way base and asphalt concrete delivery truck trips, and 3,000 two-way dump truck trips (30,000 cy @ 10 cy/trucks) over the course of 18-month bridge construction period.

It is expected that concrete delivery trucks will occur over 40 days throughout the entire bridge construction period, other delivery truck trips will occur regularly throughout the entire 18 months, base and asphalt concrete delivery truck trips will occur over six (6) months (3 months per stage)

during construction of the new roadway, and dump truck trips will occur over two (2) months (1 month per stage) to excavate for the bridge and remove the existing roadway.

Since bridge construction is expected to begin during the first phase of project construction, any traffic from bridge construction that would overlap with Phase 2 of the project was included in the trip generation calculations. For concrete and other/various truck trips, as well as dump truck trips, the average number of truck trips per day was calculated since these trips are expected to occur throughout the 18-month period. For base and asphalt truck trips, the amount of trips expected during the 3-months of the second stage was included in Phase 2 to provide a conservative analysis.

Consistent with the vegetation removal phase, the hourly average of overall daily truck trips was utilized to determine the AM and PM peak hour trips. This average was divided in two to represent the inbound and outbound average during the hour. The method for calculating these trips is as follows:

Concrete:	240 two-way trips	÷	40 days	=	6 two-way trips/day
	6 two-way trips/day	x	3.0 PCE	=	18 two-way trips/day
Other Deliveries:	200 two-way trips	÷	360 days	=	0.6 two-way trips/day
	0.6 two-way trips/day	x	3.0 PCE	=	2 two-way trips/day
Dump Truck:	1,500 two-way trips	÷	20 days ¹	=	75 two-way trips/day
	75 two-way trips/day	x	3.0 PCE	=	225 two-way trips/day
Base & Asphalt:	300 two-way trips	÷	60 days ¹	=	5 two-way trips/day
	5 two-way trips/day	x	3.0 PCE	=	15 two-way trips/day
<hr/>					
Total Truck Trips					260 two-way trips/day
	260 two-way trips	÷	8 hours	=	34 trips/hour ²
	34 trips/hour	÷	2 (in/out)	=	17 in/17 out trip/hour

Footnotes:

1. 20 work days assumed for one month.
2. No. of trips per hour rounded up to the nearest even number.

Worker Trips

The total number of workers associated with all construction-related activities expected to be on-site on any given day during the 36-month construction period is, at most, 20 to 40 workers. Typical work shifts are expected to be 8-hour days. It was therefore decided to assume 40 workers per day working 8-hour shifts, to be conservative. The total amount of daily trips generated by workers would be 80 ADT. The peak hour volumes (AM and PM peaks) were estimated assuming that all workers arrive on-site prior to the start of the AM peak period, which is 7:00 AM. It was assumed that the total worker force would leave during the PM peak period (between 4:00 and 6:00 PM). Therefore, zero (0) worker trips would be generated during the AM peak period and 80 worker trips would be generated during the PM peak period (0 inbound/ 40 outbound).

Miscellaneous Trips

It is also expected that assorted, miscellaneous trips would occur, such as visits by inspectors and engineers, deliveries of materials and plans not discussed already, etc. Some truck trips were also accounted for in miscellaneous trips.

Summary of Project Volumes

Table 8–1 shows a summary of the project’s daily, AM and PM peak hour trip calculations.

**TABLE 8–1
PROJECT TRIP GENERATION**

Phase 2 Component	Amount ^a	Rate ^b	PCE ^c	Volume				
				ADT ^d	AM Peak Hour		PM Peak Hour	
					In	Out	In	Out
Vegetation Removal								
Trucks	21	2	3.0	126	7	7	7	7
Bridge Replacement								
Concrete Delivery Trucks ^e	3	2	3.0	18	2	2	2	2
Other Delivery Trucks	0.3	2	3.0	2	0	0	0	0
Dump Trucks	37.5	2	3.0	225	14	14	14	14
Base & Asphalt Trucks	2.5	2	3.0	15	1	1	1	1
Subtotal	—	—	—	260	17	17	17	17
Worker Trips								
Workers	40	2	1.0	80	0	0	0	40
Miscellaneous Trips								
Visitors/other:	20	2	1.0	40	10	10	10	10
Trucks:	1	2	3	6	1	1	1	1
Subtotal:	—	—	—	46	11	11	11	11
Total Worker/Other Trips				120	10	10	10	50
Total Truck Trips				392	25	25	25	25
Total Maximum Traffic – Phase 2				512	35	35	35	75

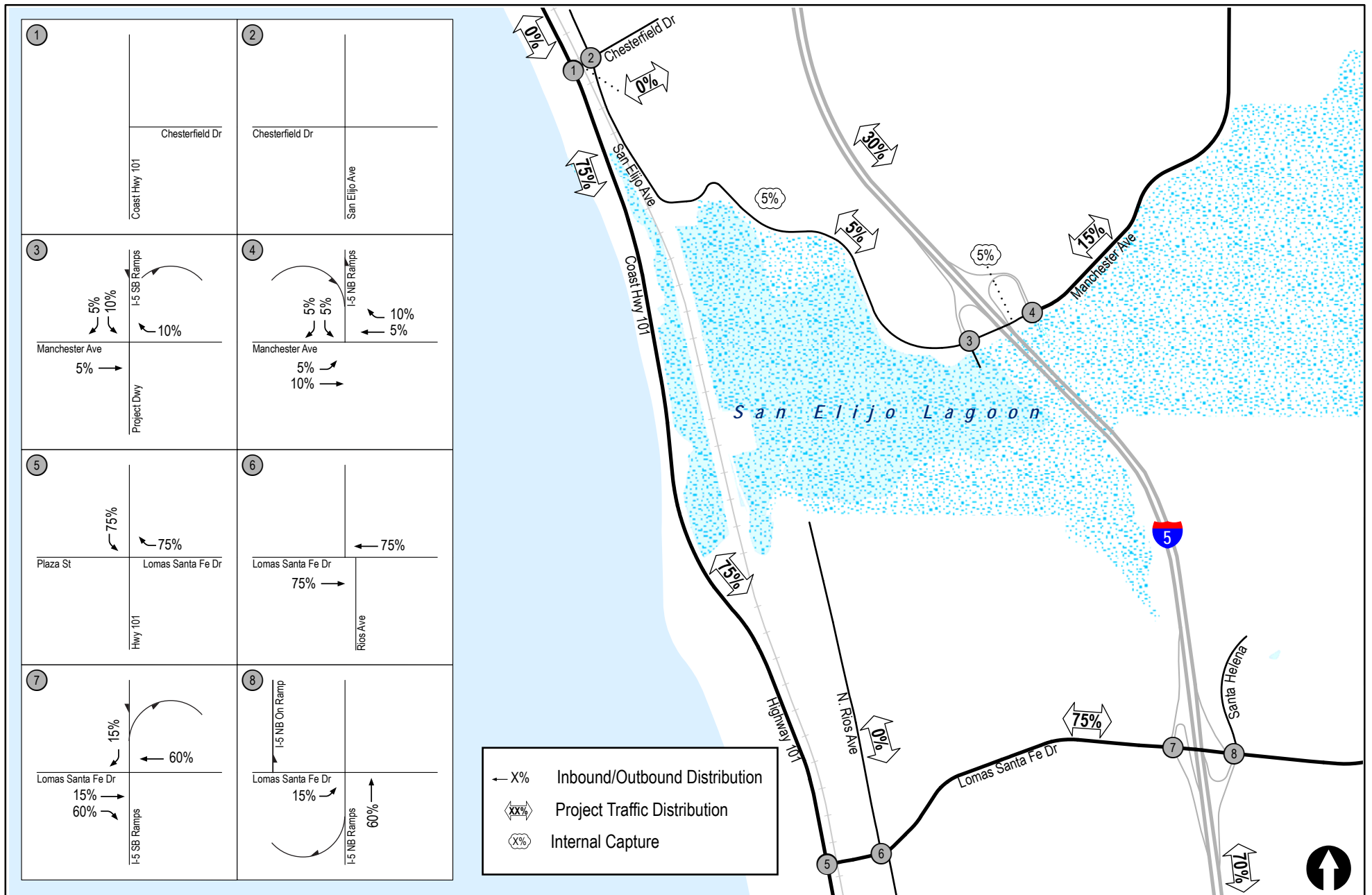
Footnotes:

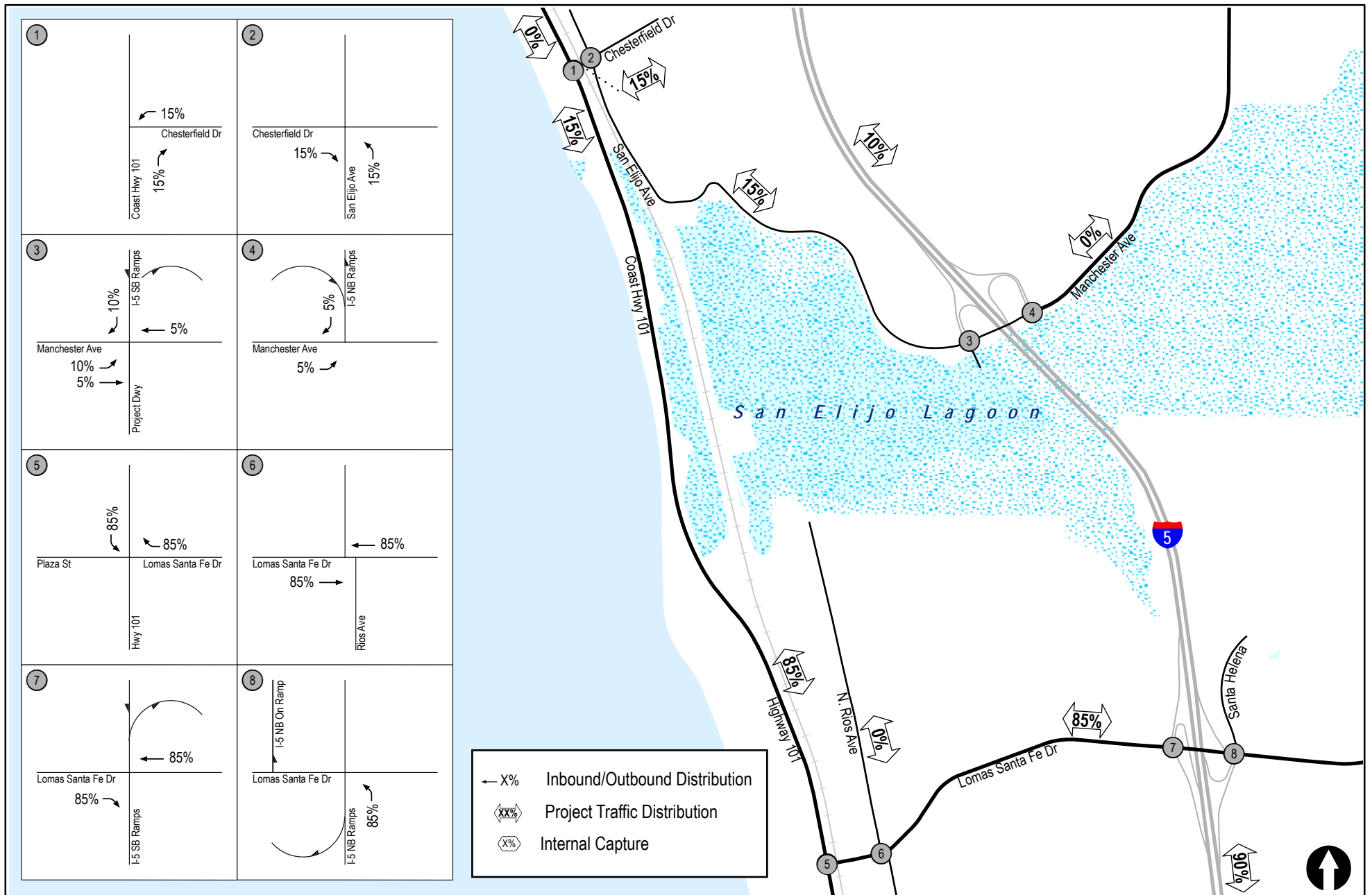
- “Amount” represents number of trucks or workers or visitors per day as described in *Section 8.1*.
- “Rate” represents the number of trips per component. One-half of workers are expected to leave and return at least once during the day, hence 20 miscellaneous worker trips.
- PCE = Passenger car equivalent factor used to account for heavy vehicles.
- ADT = Average daily trips.
- Concrete truck peak hour in/out trips rounded up to nearest even number.

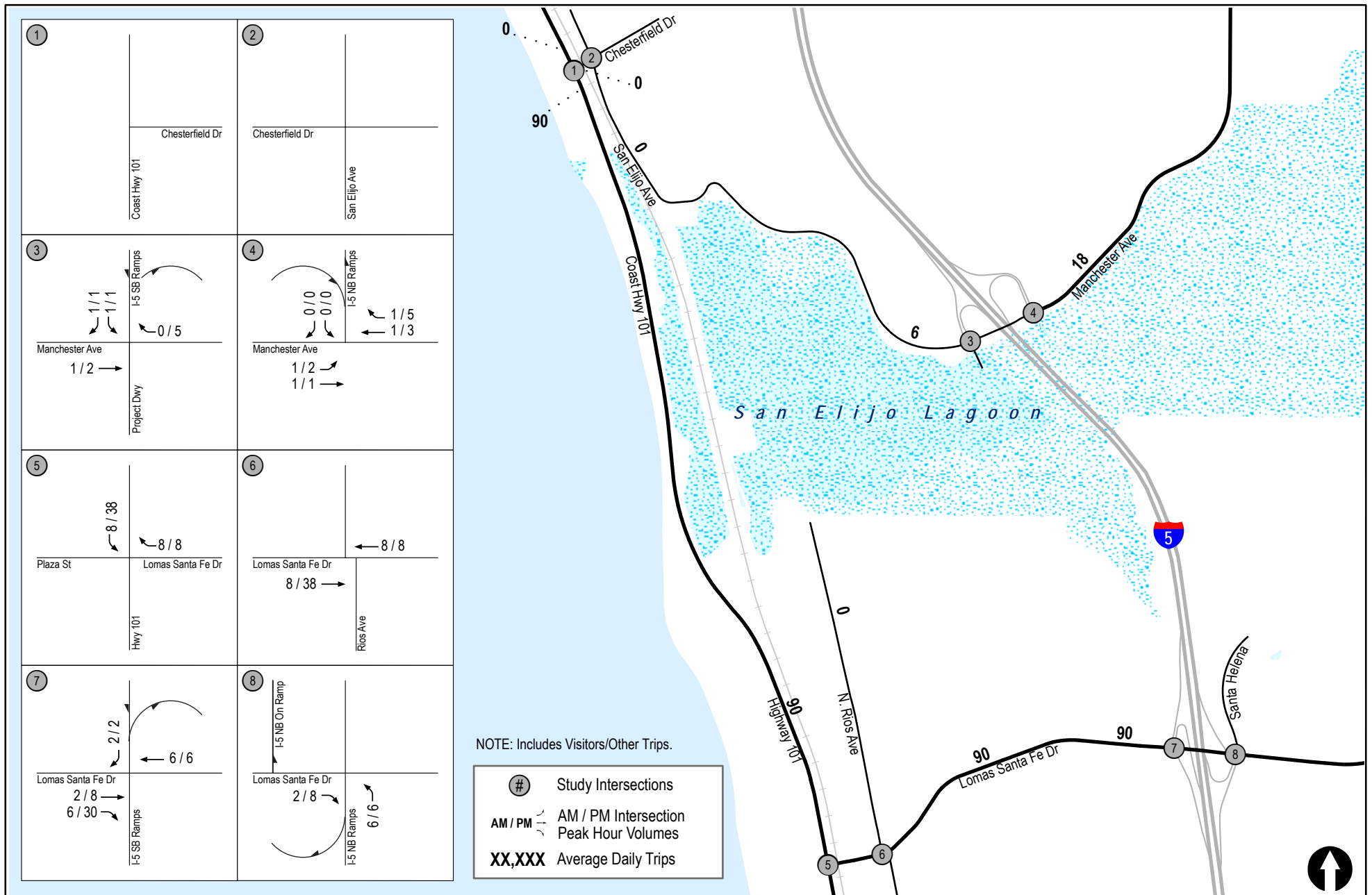
8.2 Trip Distribution/Assignment

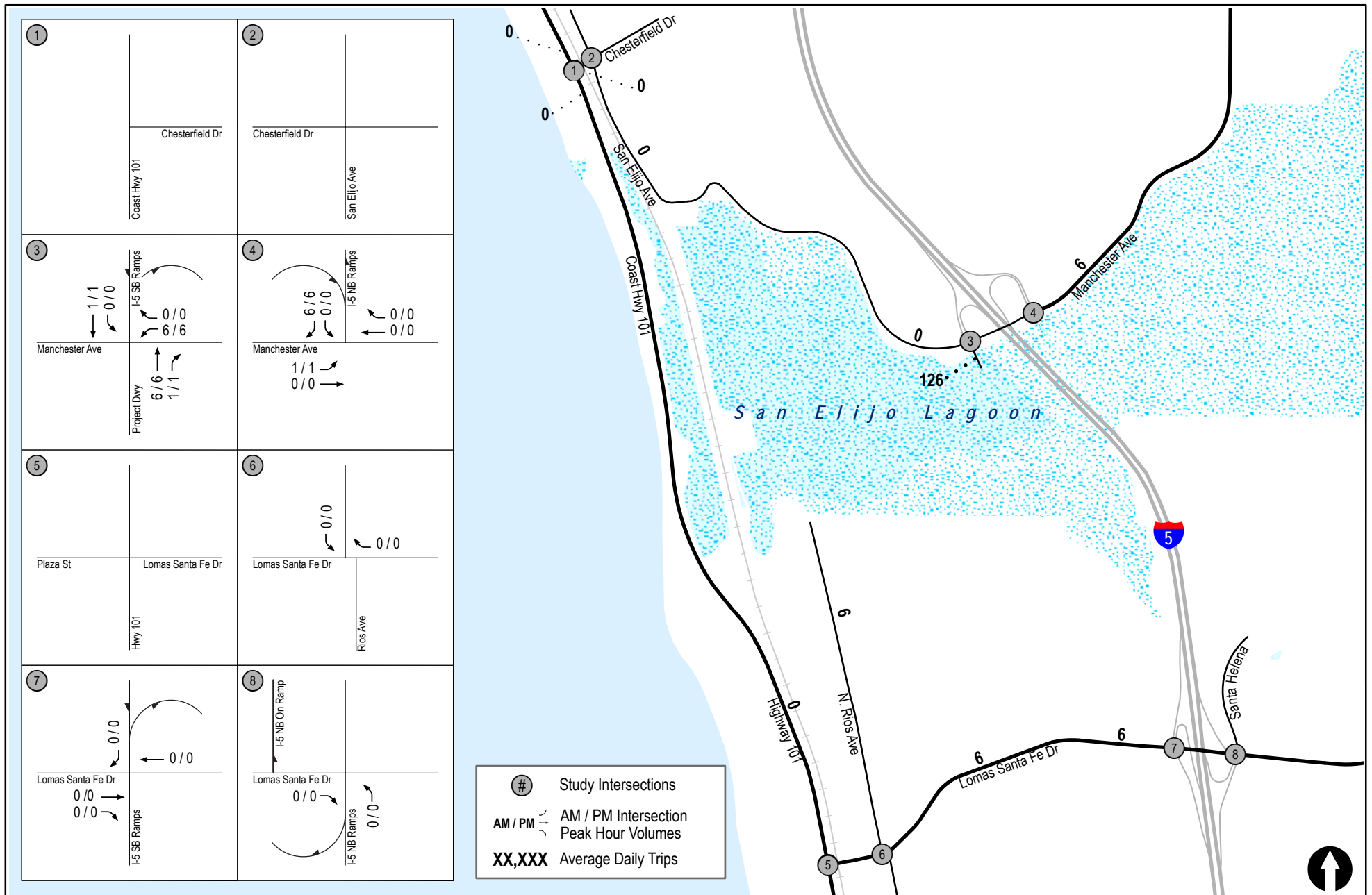
The project is a construction project, utilizing workers and equipment from outside of the study area. As such, project-related trips are expected to be oriented to/from I-5. Destinations within the study area, adjacent to the lagoon, were identified by the project team for worker parking, vegetation clearing activities, and bridge replacement activities. It is anticipated that workers may arrive at the various parking lots, then be shuttled to their positions on-site. **Appendix D** contains information from the project team illustrating potential parking areas and the general vegetation removal areas and bridge replacement staging areas, where truck trips could be expected to occur. LLG estimated the project distribution for both worker trips and truck trips (vegetation removal and bridge replacement) based on this information. It should also be noted that a nominal amount of traffic is expected to occur on Rios Avenue during vegetation removal activities, related to equipment staging and set-up. As such, vegetation removal trips were distributed on this segment and at the Lomas Santa Fe Drive/ Rios Avenue intersection. Details are provided in the tables in *Section 9.0*.

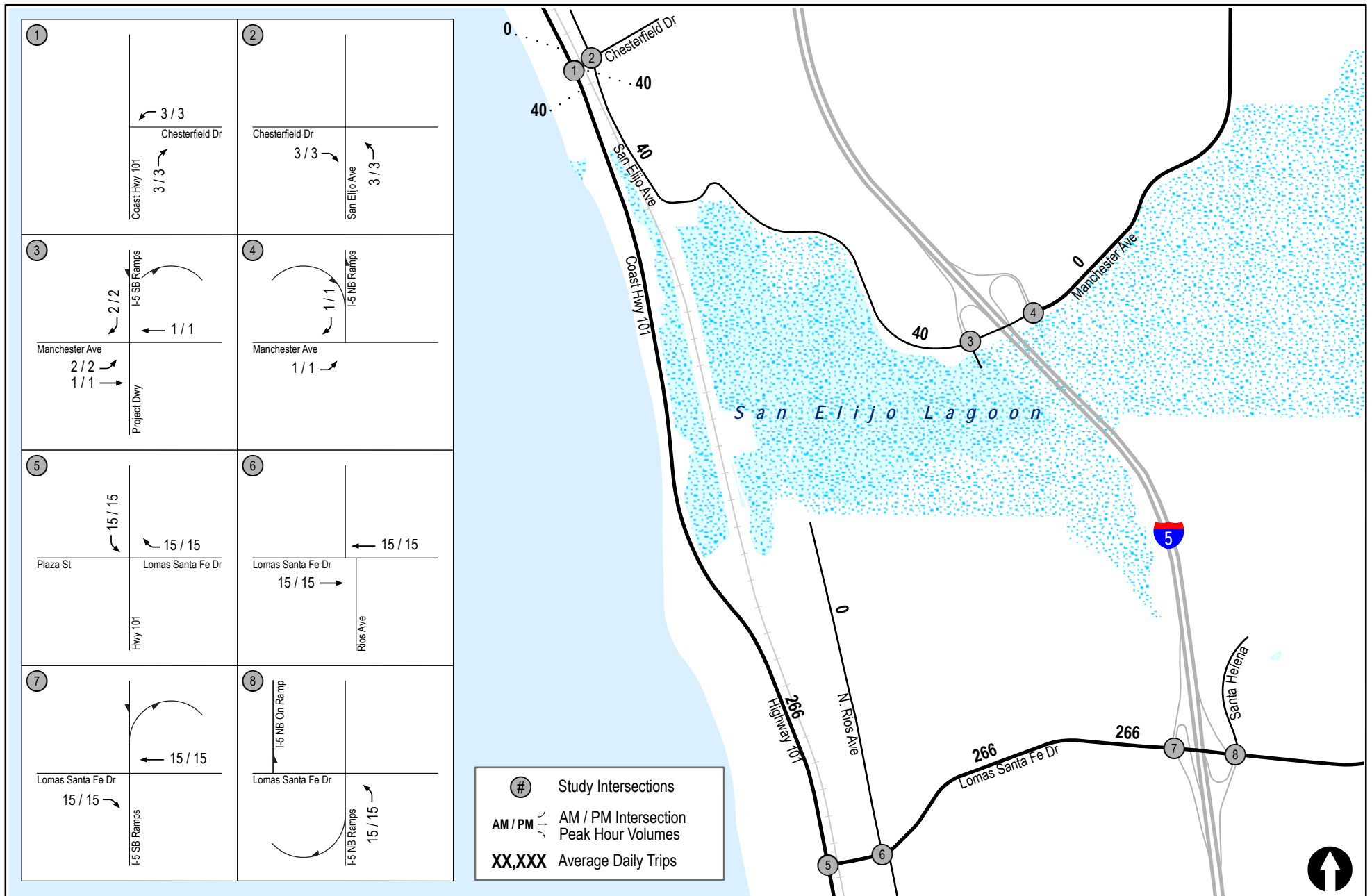
Figure 8-1a shows the traffic distribution for workers. **Figure 8-1b** shows the traffic distribution for vegetation removal truck trips and **Figure 8-1c** shows the traffic distribution for bridge replacement truck trips. **Figure 8-2a** shows the project traffic assignment for workers, while **Figure 8-2b** and **Figure 8-2c** show the project traffic assignment for vegetation removal truck trips and bridge replacement truck trips, respectively. **Figure 8-3** shows the total project's traffic assignment (peak hour trips and ADTs). **Figure 8-4** shows the construction period traffic volumes.

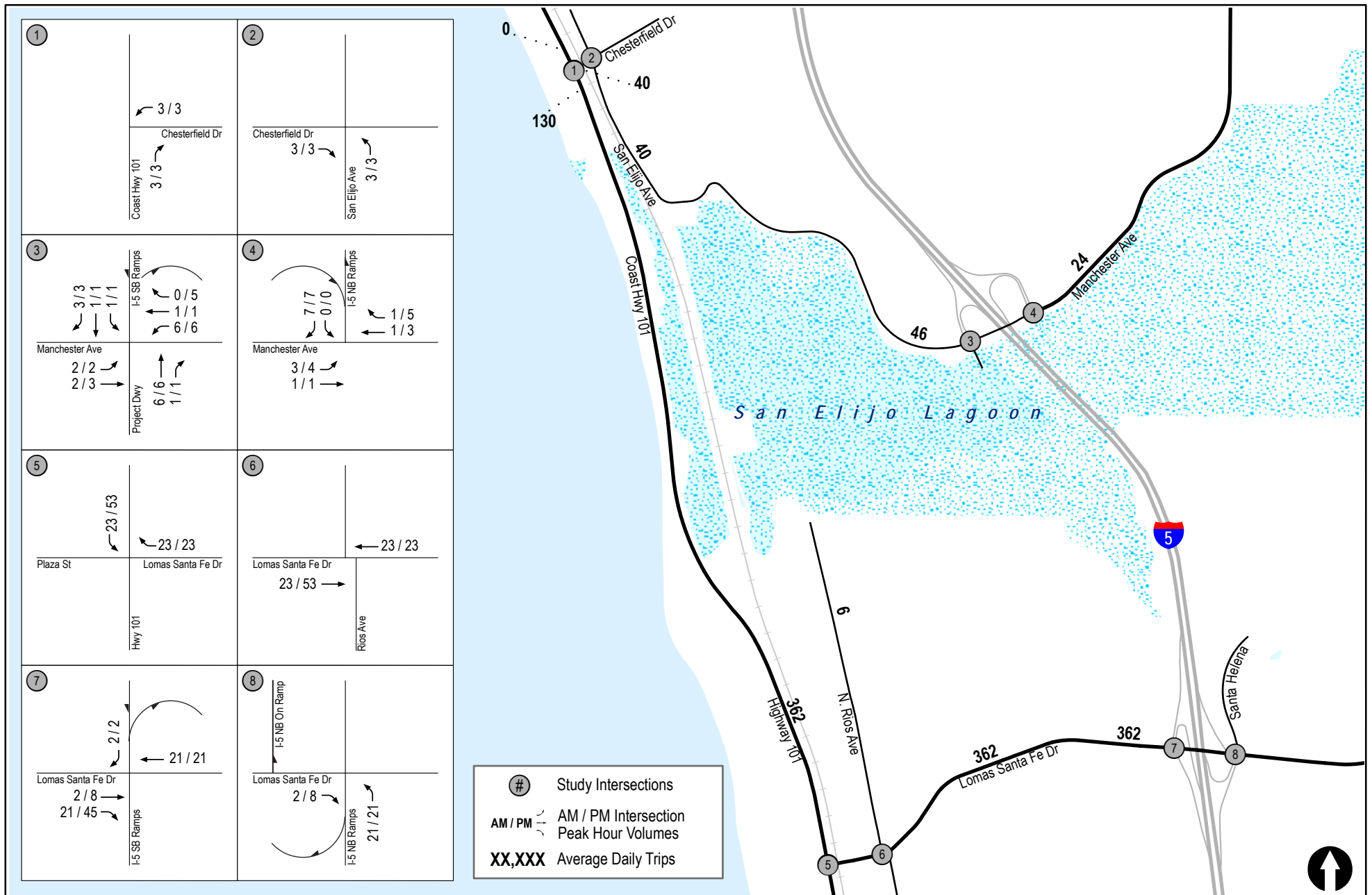


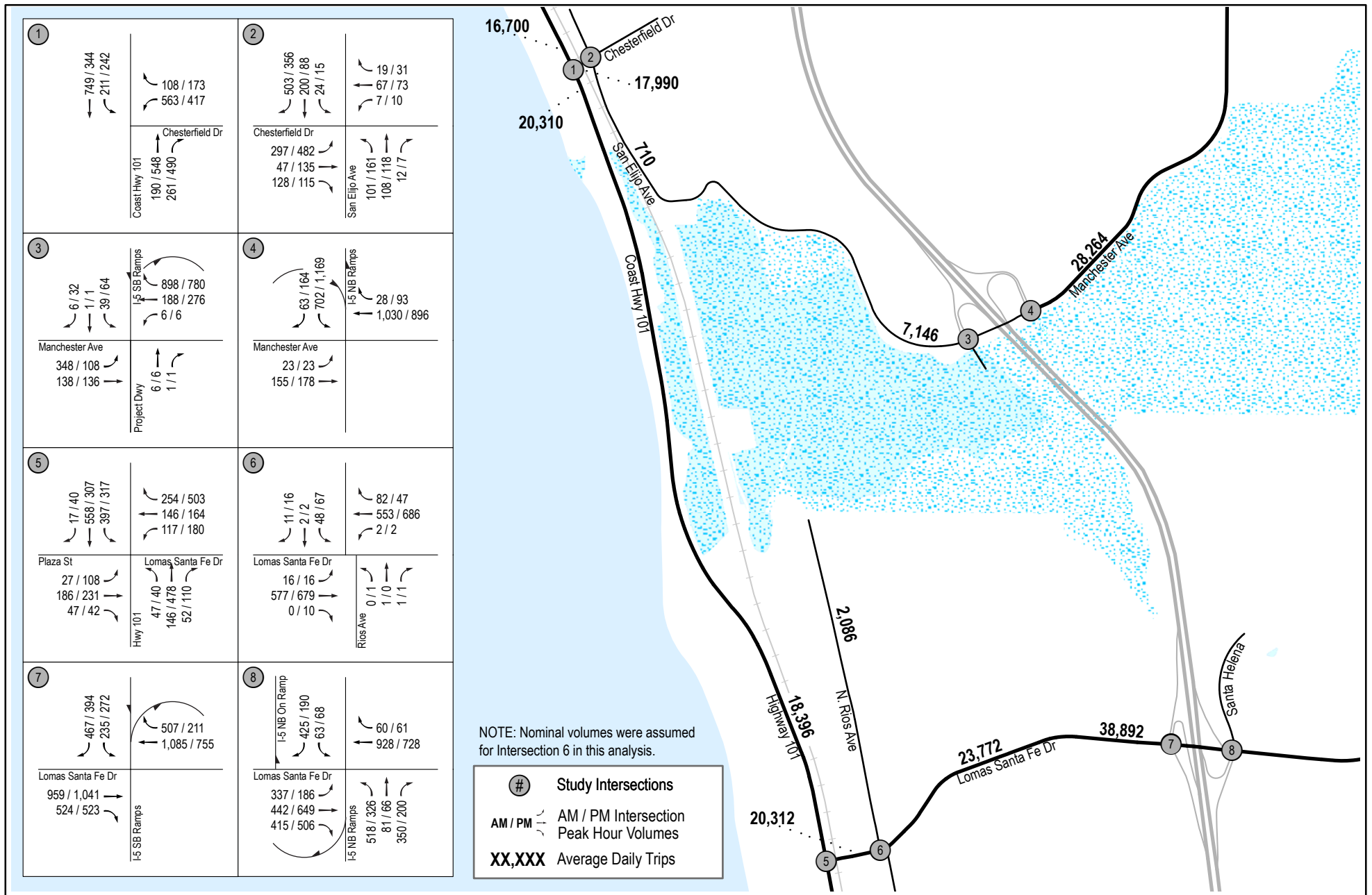












9.0 ANALYSIS OF CONSTRUCTION SCENARIOS

9.1 Pre-construction Conditions

9.1.1 Peak Hour Intersection Levels of Service

Table 9–1 summarizes the pre-construction peak hour intersection operations. *Table 9–1* shows that all the study area signalized and unsignalized intersections are calculated to operate at LOS D or better.

Table 9–1 also shows a summary of the weekday peak hour unsignalized intersection operations. *Appendix C* contains the HCM intersection analysis worksheets.

9.1.2 Daily Street Segment Operations

Table 9–2 summarizes the pre-construction roadway segment operations. As seen in *Table 9–2*, all the study area roadway segments are calculated to operate at LOS D or better on a daily basis except for the following location:

- Lomas Santa Fe Drive – Solana Hills Drive to I-5, LOS E

9.2 Construction Period

9.2.1 Peak Hour Intersection Levels of Service

Table 9–1 summarizes the construction period peak hour signalized intersection operations. *Table 9–1* shows that with the addition of project traffic, all the study area signalized and unsignalized intersections are calculated to continue to operate at LOS D or better.

Appendix C contains the HCM intersection analysis worksheets.

9.2.2 Daily Street Segment Operations

Table 9–2 summarizes the construction period roadway segment operations. As seen in *Table 9–2*, all the study area roadway segments are calculated to currently operate at LOS D or better on a daily basis except for the following location:

- Lomas Santa Fe Drive – Solana Hills Drive to I-5, LOS E

While the LOS remains at LOS E, the V/C increase does not exceed the 0.020 V/C maximum identified in the SANTEC/ITE guidelines. ***No significant impact is calculated at this location.***

**TABLE 9-1
INTERSECTION OPERATIONS**

Intersection	Control Type	Peak Hour	Pre-Construction		Construction Period		
			Delay ^a	LOS ^b	Delay	LOS	Δ ^c
1. Chesterfield Drive/ Coast Highway 101 ^d	Signal	AM	20.3	C	20.3	C	0.0
		PM	27.4	C	27.4	C	0.0
2. Chesterfield Drive/ San Elijo Avenue ^d	Signal	AM	23.3	C	23.5	C	0.2
		PM	21.7	C	21.8	C	0.1
3. Manchester Avenue/ I-5 Southbound Ramps	AWSC ^e	AM	17.5	C	17.5	C	0.0
		PM	12.4	B	12.6	B	0.2
4. Manchester Avenue/ I-5 Northbound Ramps	Signal	AM	18.5	B	18.7	B	0.2
		PM	23.6	C	24.0	C	0.4
5. Lomas Santa Fe Drive/ Coast Highway 101	Signal	AM	29.8	C	31.9	C	2.1
		PM	34.6	C	37.3	C	2.3
6. Lomas Santa Fe Drive/ Rios Avenue ^f	Signal	AM	10.8	B	10.8	B	0.0
		PM	11.9	B	11.9	B	0.0
7. Lomas Santa Fe Drive/ I-5 Southbound Ramps	Signal	AM	20.2	C	20.5	C	0.5
		PM	19.8	B	20.2	C	0.4
8. Lomas Santa Fe Drive/ I-5 Northbound Ramps	Signal	AM	49.2	D	49.8	D	0.6
		PM	29.2	C	29.6	C	0.4

Footnotes:

- Average delay expressed in seconds per vehicle.
- Level of Service.
- Δ = Change in Delay due to construction traffic.
- LOS/Delay represent non-railroad affected signal timing.
- AWSC – All Way Stop Controlled intersection.
- Although vegetation removal traffic was assigned to the Lomas Santa Fe/Rios Avenue intersection due to the location of a project access/staging area at the terminus of this residential street, 0 trips would be expected to occur during the AM/PM peak hours.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

**TABLE 9-2
STREET SEGMENT OPERATIONS**

Street Segment	Jurisdiction	Capacity (LOS E) ^a	Pre-Construction			Construction Period			
			ADT ^b	LOS ^c	V/C ^d	ADT	LOS	V/C	Δ ^e
Coast Highway 101									
North of Chesterfield Drive	Encinitas	35,200	16,700	A	0.474	16,700	A	0.474	0.000
South of Chesterfield Drive	Encinitas	35,200	20,180	A	0.573	20,310	A	0.577	0.004
North of Lomas Santa Fe Drive ^f	Solana Beach	30,000	18,040	C	0.601	18,396	C	0.613	0.012
Chesterfield Drive									
East of Coast Highway 101	Encinitas	32,400	17,950	A	0.554	17,990	A	0.555	0.001
San Elijo Avenue									
South of Chesterfield Drive	Encinitas	20,000	670	A	0.034	710	A	0.036	0.002
Manchester Avenue									
West of I-5 Southbound Ramps	Encinitas	20,000	7,100	A	0.355	7,146	A	0.357	0.002
East of I-5 Northbound Ramps	Encinitas	32,400	28,240	D	0.872	28,264	D	0.872	0.001
Rios Avenue									
North of Lomas Santa Fe Drive ^g	Solana Beach	8,000	2,080	A	0.260	2,086	A	0.261	0.001
Lomas Santa Fe Drive									
East of Coast Highway 101	Solana Beach	40,000	19,950	B	0.499	20,312	B	0.508	0.009
Hilmen Drive to Stevens Avenue	Solana Beach	40,000	23,410	C	0.585	23,772	C	0.594	0.009
Solana Hills Drive to I-5	Solana Beach	40,000	38,530	E	0.963	38,892	E	0.972	0.009

Footnotes:

- Capacities based on the City of Encinitas and City of Solana Beach roadway classification tables.
- Average Daily Traffic Volumes.
- Level of Service.
- Volume to Capacity.
- Δ = Change in Delay due to construction traffic.
- Coast Highway 101 north of Lomas Santa Fe Drive is constructed with one lane in the southbound direction and two lanes in the northbound direction separated by a landscaped raised median. Therefore, a modified capacity of 30,000 ADT for a 4-Lane Major Arterial was used in the analysis.
- A nominal amount of trips generated during the vegetation removal phase of the project would be expected to use Rios Avenue to reach a site access/staging area at the northern terminus of this residential roadway (6 ADT).

10.0 COAST HIGHWAY 101 – BRIDGE REPLACEMENT ASSESSMENT

The bridge on Coast Highway 101 across the mouth of the lagoon would be demolished and replaced in two parts, as discussed in *Section 8.1*. Again, two-way traffic would be maintained throughout the 18-month construction period. To assess the potential impacts to local circulation due to the restriction in available lanes, the volume and capacity of the study segment was considered.

10.1 Traffic Volumes

The forecasted construction period traffic volume on Coast Highway 101 near the bridge is 20,310 ADT (see *Table 9-2*), of which some percentage is comprised of discretionary trips, and some percentage is comprised of necessary trips. “Discretionary” trips are those that are on Coast Highway 101 out of convenience or pleasure. These might include commuters seeking to avoid peak hour traffic congestion on Interstate 5, or tourists and visitors sight-seeing along the coast. Discretionary trips do not need to occur on Coast Highway 101, and could just as well utilize Interstate 5.

“Necessary” trips along Coast Highway 101 would be comprised of local residential or business trips between coastal cities that would use Coast Highway 101 as the fastest route between destinations. They too could use Interstate 5, but to do so would be exceptionally out of direction.

With respect to the bridge replacement, it is assumed that the necessary trips would remain on Coast Highway 101, despite the diminished capacity through the construction zone, while the discretionary trips would either avoid Coast Highway 101 altogether, or would divert to Interstate 5 before the construction zone. The final lateral roadways to divert would be (coming from the south) Lomas Santa Fe Drive, or (coming from the north) Manchester Avenue via Chesterfield Drive.

Peak hour directional counts on Coast Highway 101 show a “complementary trip imbalance” in the northbound/southbound directions, favoring the southbound direction in the PM peak hour. This means that the number of southbound trips during the PM peak hour is greater than the complementary number of northbound trips from the AM peak hour. Were all trips on this segment necessary trips, the northbound AM and southbound PM peak hour volumes could be expected to be complement one another. Since more southbound trips are observed in the PM peak hour (725 PM southbound trips compared to 471 AM northbound trips, based on the road tube counts), it may be deduced that the difference of 254 trips represents discretionary trips, presumably avoiding southbound congestion on Interstate 5.

This example represents trip characteristics during the commuter peak hour. The relative amount of discretionary vs. necessary trips during the non-commuter peak hour is much less determinable given the complex nature of non-commuter trip-making. It does, however, substantiate the idea that discretionary trips are in the system, and are not insubstantial.

10.2 Capacity

While the preceding discussion establishes that discretionary trips occur on Coast Highway 101, these trips are certainly variable depending on time of day, day of week, and season of the year. The available data does not support a precise empirical method for the determination of trip to be displaced from Coast Highway 101 to Interstate 5. An alternative method is to consider the full and reduced capacity of the roadway segment, and the latent demand that is displaced and diverted with the latter.

Table 9–2 (Section 9) shows that during the construction period, the volume on the subject segment of Coast Highway 101 (south of Chesterfield Drive) is 20,310 ADT, with a 4-lane roadway capacity of 35,200 ADT. When the bridge construction occurs, roadway capacity would be reduced by two-lanes (fifty percent), to 17,600 ADT. Assuming that all 20,310 ADT wish to be on this segment, the latent, unserved demand of the reduced-capacity roadway is thus 2,580 ADT (20,310 ADT demand – 17,600 ADT served = 2,710 ADT unserved). These would be characterized as discretionary trips, which would utilize Interstate 5 as an alternate route.

Assuming this unserved Coast Highway 101 volume (1,355 northbound and 1,355 southbound) waited until the last opportunity to exit Coast Highway 101 to divert to Interstate 5, it would utilize Lomas Santa Fe Drive and Chesterfield Drive, respectively.

10.2.1 Operations

Table 10–1 shows the daily segment operations in the study area for the construction period with and without the bridge replacement closure. As shown in *Table 10–1*, the segments listed below would be affected by the partial closure of the bridge:

- Coast Highway 101 – South of Chesterfield Drive, LOS E
- Lomas Santa Fe Drive – Solana Hills Drive to I-5, LOS F

These project impacts would exceed the allowable thresholds, and therefore be considered significant direct project impacts.

TABLE 10-1
BRIDGE REPLACEMENT STREET SEGMENT OPERATIONS

Street Segment	Jur.	Construction Period Without Bridge Closure				Construction Period With Bridge Closure					
		Capacity (LOS E) ^a	ADT ^b	LOS ^c	V/C ^d	Capacity (LOS E) ^a	Diverted Trips	ADT	LOS	V/C	Δ ^e
Coast Highway 101											
North of Chesterfield Drive	Encinitas	35,200	16,700	A	0.474	35,200	—	16,700	A	0.474	0.000
South of Chesterfield Drive	Encinitas	35,200	20,310	A	0.577	17,600*	(2,710)	17,600	E	1.000	0.423
North of Lomas Santa Fe Drive ^f	Encinitas	30,000	18,396	C	0.613	30,000	—	18,396	C	0.613	0.000
Chesterfield Drive											
East of Coast Highway 101	Encinitas	32,400	17,990	A	0.555	32,400	1,355	19,345	A	0.597	0.042
San Elijo Avenue											
South of Chesterfield Drive	Encinitas	20,000	710	A	0.036	20,000	1,355	2,065	A	0.103	0.068
Manchester Avenue											
West of I-5 Southbound Ramps	Encinitas	20,000	7,146	A	0.357	20,000	1,355	8,501	A	0.425	0.068
East of I-5 Northbound Ramps	Encinitas	32,400	28,264	D	0.872	32,400	—	28,264	D	0.872	0.000
Rios Avenue											
North of Lomas Santa Fe Drive	Solana Beach	8,000	2,086	A	0.261	8,000	—	2,086	A	0.261	0.000
Lomas Santa Fe Drive											
East of Coast Highway 101	Solana Beach	40,000	20,312	B	0.261	40,000	1,355	21,667	C	0.542	0.034
Hilmen Drive to Stevens Avenue	Solana Beach	40,000	23,772	C	0.594	40,000	1,355	25,127	C	0.628	0.034
Solana Hills Drive to I-5	Solana Beach	40,000	38,892	E	0.508	40,000	1,355	40,247	F	1.006	0.034

Footnotes:

- Capacities based on the City of Encinitas and City of Solana Beach roadway classification tables.
- Average Daily Traffic Volumes.
- Level of Service.
- Volume to Capacity.
- Δ = Change in Delay due to diverted trips.

General Notes:

- Jur = Jurisdiction
- The two-lane capacity of Coast Highway 101 is half of the 4-lane capacity (35,200 ADT ÷ 2 = 17,600 ADT)
- The demand on Coast Highway 101 exceeds the reduced capacity by 2,710 ADT.
- The excess demand (2,710 ADT) is expected to divert to Chesterfield Drive/Manchester Avenue and Lomas Santa Fe Drive.
- The total diverted trips are divided by 2: NB = 1,355 ADT to Lomas Santa Fe Drive; SB = 1,355 ADT to Chesterfield Drive/Manchester Avenue

10.3 Summer/Special Event Season Evaluation

As mentioned earlier in this report, construction is expected to begin in late 2016 and be completed by spring 2019. This schedule would overlap with two (2) summer seasons when special events such as the San Diego County Fair and the Del Mar Races are held. According to the sequenced phasing, Phases 1, 2 and 4 include activities that would overlap with a summer season. The first two phases also include the first 10 months of bridge replacement construction. This time frame includes the partial closure of the Coast Highway 101 bridge which would coincide with the summer 2018 fair and race season.

The analysis provided in this report was conducted using weekday October traffic volumes to represent typical non-summer traffic patterns in the area when fair and race events are not operating. In order to determine how the closure of the bridge would affect summer season weekday traffic volumes, a review of historical average daily traffic count data was conducted.

A comparison between three summer scenarios against the October counts was conducted: off-season typical summer traffic; summer fair traffic; and summer race traffic. Weekday traffic count data taken from the 22nd DAA 2008 Master Plan Traffic Study prepared by LLG in 2009 was compared on the segment of Coast Highway 101 south of Lomas Santa Fe Drive. Based on a review of these three scenarios, the average increase in weekday traffic during the summer months (off-season and fair and race season) is generally 26%. The majority of this traffic increase occurs along Coast Highway 101 as beachgoers, visitors, and fairgrounds patrons travel this scenic route. For purposes of being conservative, the 26% traffic increase calculated from Master Plan counts was used to evaluate the effect of summer/special event traffic on all study area roadways. **Appendix E** contains the traffic volume comparison.

It can therefore be anticipated that during the peak summer/special event season while bridge replacement construction is operating, an increase in traffic volumes of 26% could be expected within the study area in addition to the rerouting of “necessary” trips discussed above in *Section 10.1*.

10.3.1 Operations

Table 10–2 shows the daily segment operations in the study area for the summer/special event season pre-construction period and during the construction period with and without the bridge replacement closure. As shown in **Table 10–2**, the segments listed below would be expected to operate at LOS F during both during the pre-construction and construction period:

- Manchester Avenue – East of I-5 Northbound Ramps, LOS F
- Lomas Santa Fe Drive – Solana Hills Drive to I-5, LOS F

Since the increase in the v/c on these two segments with the addition of project traffic does not exceed the allowable thresholds, no significant project impacts would be expected during the summer/special event season.

Also shown in *Table 10–2* are the operations during the summer/special event season with and without the partial bridge closure. As shown in the table, the segments listed below would be affected by the partial closure of the bridge:

- Coast Highway 101 – South of Chesterfield Drive, LOS E
- Lomas Santa Fe Drive – Solana Hills Drive to I-5, LOS F

These project impacts, the same locations identified in Section 10.2.1, would exceed the allowable thresholds, and therefore be considered significant direct project impacts.

TABLE 10-2
SUMMER/SPECIAL EVENT SEASON STREET SEGMENT OPERATIONS

Street Segment	Jur.	Capacity (LOS E) ^a	Summer/Special Event Pre-Construction			Summer/Special Event Construction Period				Summer/Special Event Construction Period With Bridge Closure					
			ADT ^b	LOS ^c	V/C ^d	ADT	LOS	V/C	Δ ^e	Capacity (LOS E) ^a	Diverted Trips	ADT	LOS	V/C	Δ ^e
Coast Highway 101															
North of Chesterfield Dr	Encinitas	35,200	20,880	A	0.593	20,880	A	0.593	0.000	35,200	—	20,880	A	0.593	0.000
South of Chesterfield Dr	Encinitas	35,200	25,230	C	0.717	25,360	C	0.720	0.003	17,600*	(2,710)	22,520	F	1.280	0.563
North of Lomas Santa Fe Dr ^f	Encinitas	30,000	22,550	D	0.752	22,906	D	0.764	0.012	30,000	—	22,550	D	0.752	0.000
Chesterfield Drive															
East of Coast Highway 101	Encinitas	32,400	22,440	B	0.693	22,480	B	0.694	0.001	32,400	1,355	23,795	C	0.734	0.041
San Elijo Avenue															
South of Chesterfield Drive	Encinitas	20,000	840	A	0.042	880	A	0.044	0.002	20,000	1,355	2,195	A	0.110	0.068
Manchester Avenue															
West of I-5 SB Ramps	Encinitas	20,000	8,880	A	0.444	8,926	A	0.446	0.002	20,000	1,355	10,235	A	0.512	0.068
East of I-5 NB Ramps	Encinitas	32,400	35,300	F	1.090	35,324	F	1.090	0.000	32,400	—	35,300	F	1.090	0.000
Rios Avenue															
North of Lomas Santa Fe Dr	Solana Beach	8,000	2,600	B	0.325	2,606	B	0.326	0.001	8,000	—	2,600	B	0.325	0.000
Lomas Santa Fe Drive															
East of Coast Highway 101	Solana Beach	40,000	24,940	C	0.624	25,302	C	0.633	0.009	40,000	1,355	26,295	C	0.657	0.033
Hilmen Dr to Stevens Ave	Solana Beach	40,000	29,260	C	0.732	29,622	C	0.741	0.009	40,000	1,355	30,615	D	0.765	0.033
Solana Hills Dr to I-5	Solana Beach	40,000	48,160	F	1.204	48,522	F	1.213	0.009	40,000	1,355	49,515	F	1.238	0.034

Footnotes:

- Capacities based on the City of Encinitas and City of Solana Beach roadway classification tables.
- Average Daily Traffic Volumes.
- Level of Service.
- Volume to Capacity.
- Δ = Change in Delay due to project and project + diverted trips.

General Notes:

- Jur = Jurisdiction
- Pre-construction summer/special event volumes grown by 26%.
- The two-lane capacity of Coast Highway 101 is half of the 4-lane capacity (35,200 ADT ÷ 2 = 17,600 ADT)
- The demand on Coast Highway 101 exceeds the reduced capacity by 2,710 ADT.
- The excess demand (2,710 ADT) is expected to divert to Chesterfield Drive/Manchester Avenue and Lomas Santa Fe Drive.
- The total diverted trips are divided by 2:

10.4 Conclusion

It can be concluded that the only contributing factor to the occurrence of significant project impacts is the partial closure of the bridge. The tables in the sections above show that although traffic increases are anticipated during the summer/special event baseline condition, the diversion of “necessary trips” in addition to the reduction in capacity of the bridge are the key contributors to significant impacts on Coast Highway 101 and Lomas Santa Fe Drive.

These roadway segments would not be significantly impacted by project traffic with the development of any project alternative during both the off-season and summer/special event season that does not include partial closure of the Coast Highway 101 Bridge since the greatest V/C increase on poorly operating street segments does not exceed the allowable thresholds.

11.0 SIGNIFICANCE OF IMPACTS/ MITIGATION MEASURES

The analysis presents the results of the Alternative 2A project during Phase 32 of construction. The analysis also assumes that each phase occurs sequentially for 36 months, beginning in late 2016. The primary traffic generating components of the overall project are the vegetation removal and bridge replacement, which would generate both worker and truck tips. A reduction in roadway capacity would also occur with the demolition and reconstruction of the bridge on Coast Highway 101 across the mouth of the lagoon. This is expected to result in diverted trips from Coast Highway 101 to Interstate 5, via Chesterfield Drive to San Elijo Avenue to Manchester Avenue to the north of the bridge, and Lomas Santa Fe Drive to the south of the bridge. Collectively, these construction operations are calculated to result in the following temporary, direct significant impacts during the construction period:

11.1 Significant Impacts

D1. Coast Highway 101 – South of Chesterfield Drive

D2. Lomas Santa Fe Drive – Solana Hills Drive to Interstate 5

11.2 Mitigation Measures

MM2. Coast Highway 101 – South of Chesterfield Drive

- *The impact is caused by the reduction in capacity associated with the demolition and reconstruction of the bridge. There is no mitigation to reduce this impact to less than significant. **This would remain a significant and short-term temporary direct unmitigated impact.***

MM3. Lomas Santa Fe Drive – Solana Hills Drive to Interstate 5

- *The impact is caused by the reduction in capacity associated with the demolition and reconstruction of the bridge, and the subsequent redistribution of northbound traffic to Interstate 5 via Lomas Santa Fe Drive. There is no mitigation to reduce this impact to less than significant. **This would remain a significant and short-term temporary direct unmitigated impact.***

11.3 Project Alternatives

As noted in the report, the findings above for Alternative 2A represent the worst-case construction phase within the worst-case project alternative, both of which include effects of demolition and replacement of the bridge across the lagoon mouth on Coast Highway 101. This construction phase will result in the redistribution of traffic to/from Coast Highway 101 to lateral roadways both north and south of the bridge (such as Lomas Santa Fe Drive), while simultaneously reducing capacity in the construction area by two lanes (50%). Impacts D1 and D2 above both occur because of this bridge reconstruction effort.

Based on the Pre-construction volumes, capacities and LOS, Impacts D1 and D2 would only be expected to occur with project alternatives which include temporary partial bridge closures.

It should also be noted that an evaluation of the effects of the summer/special events season was conducted both with and without the bridge replacement/closure activities expected with the proposed project. The significance drawn from this analysis is synonymous with the conclusions above.

End of Report

